Cl **00** SC **0** P **0** L **0** MyBallot # 21

COORDINATION, EDITORIAL

Comment Type **GR** *Comment Status* **D**

At the time of submission to the IEEE-SASB, or just prior to publication, you will need to supply email address for each member of the Working Group that worked on this standard. This will ensure that all members of the Working Group receive a complimentary PDF of the published standard.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

List has been provided to Michelle Turner

Cl **00** SC **0** P **0** L **0** MyBallot # 20

COORDINATION, EDITORIAL

Comment Type **GR** *Comment Status* **D**

Separate electronic files of figures shall be supplied in TIFF format (unless created in FrameMaker).

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Have been provided to Michelle Turner

Cl **01** SC **1.4** P **12** L **46** MyBallot # 35

TELLADO, JOSE Individual

Comment Type **E** *Comment Status* **D**

The checkerboard constellation generated from taking the maximally spaced M^2/2 points from 2D-PAM-M is called D_2 in clasical literature. A more accurate description and a reference are included below.

SuggestedRemedy

Replace1.4.xxx DSQ128: A 128 point double square (DSQ) constellation mapping. This constellation is obtained by taking a 2D constellation with 16-level pulse amplitude modulation (PAM16) on each dimension and eliminating half the points to create a checker board pattern. (See IEEE 802.3 Clause 55.)With:1.4.xxx DSQ128: The 128 point double square (DSQ) constellation used in 10GBASE-T. This constellation is obtained by taking the 256 two-dimensional points generated by the Cartesian product of two one-dimensional 16-level pulse amplitude modulation (PAM16) constellations and eliminating every other point to create a checkerboard lattice. This checkerboard constellation is called D_2 in the literature. For further information on D_2, see reference [BxD_2]. (See IEEE 802.3 Clause 55.)[BxD_2] 'Coset Codes I', D. Forney, page 1132 IEEE Trans. Info. Theory Vol. 34, No 5, Sept 1988.Similarly in (SC 55.1.3.1, page 82, line 25) replace:The DSQ128 symbols are obtained by concatenating two time-adjacent 1D PAM16 symbols and retaining among the 256 possible combinations, 128 maximally spaced 2D symbols.With:The DSQ128 symbols are obtained by concatenating two time-adjacent 1D PAM16 symbols and retaining among the 256 possible Cartesian product combinations, 128 maximally spaced 2D symbols. The resulting checkerboard constellation is called D_2 in the literature (see reference [BxD_2]).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Modify the definition as suggested and add the bibliography reference

Cl **01** SC **1.4** P **12** L **47** MyBallot # 34

TELLADO, JOSE Individual

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

The 128 point checkerboard constellation generated from a 2D-PAM16 has been labeled 128D_2 in the literature (e.g. see clasic paper by Forney'88).

SuggestedRemedy

Replace all instances of DSQ128 to 128D_2. This includes SC 1.4, SC30, SC44, SC 45 and SC 55

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1** *P* **35** *L* **49** *MyBallot #* 6

KASTURIA, SANJAY Individual

Comment Type **T** *Comment Status* **D**

In Table 45.3 of 802.3an, which summarizes the PMA / PMD registers:PMA / PMD Control 2 is listed as register 1.6This should be 1.7

SuggestedRemedy

Change 1.6 to 1.7

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.10.3** *P* **41** *L* **8** *MyBallot #* 1

MARRIS, ARTHUR Individual

Comment Type **T** *Comment Status* **D**

This subclause should be deleted because it belongs in 802.3ap backplane Ethernet

SuggestedRemedy

Delete the 1000BASE-KX subclause

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Instead of deleting, shall we change to "reserved"?

Cl **45** *SC* **45.2.1.60** *P* **42** *L* **32** *MyBallot #* 7

KASTURIA, SANJAY Individual

Comment Type **E** *Comment Status* **D**

There is a typographical error. MDI/MD-X should read MDI/MDI-XThe same typo occurs on page 43 line 6

SuggestedRemedy

Change MDI/MD-X to MDI/MDI-X

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7** *P* **52** *L* **5** *MyBallot #* 2

MARRIS, ARTHUR Individual

Comment Type **E** *Comment Status* **D**

In Table 45-117 the crossed out sections should be removed from the table.

SuggestedRemedy

Delete the crossed out rows from Table 45-117

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

These rows have been held for upcoming assignments in either .3ap or .3aq. Remove the strike outs and leave the text there.

Cl **45** *SC* **45.2.7.2** *P* **54** *L* **14** *MyBallot #* 3

MARRIS, ARTHUR Individual

Comment Type **T** *Comment Status* **D**

Is it appropriate to use 'shall' in 7.1.7 in Table 45-119? This is a status register after all.

SuggestedRemedy

Consider changing these two shalls back to wills.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change to ??? and remove any PICS specifically tied to these "shall"s

---

Cl **45** *SC* **45.2.7.2** *P* **54** *L* **31** *MyBallot #* 4

MARRIS, ARTHUR Individual

Comment Type **E** *Comment Status* **D**

Delete R/W from bottom of table 45-119 because this condition is not used in the table.

SuggestedRemedy

As above

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7.2.3** *P* **54** *L* **55** *MyBallot #* 12
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **D**

Incorrect register range.

SuggestedRemedy

Change from "register 7.16 and 7.19" to "registers 7.16 through 7.21".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7.2.3** *P* **54** *L* **56** *MyBallot #* 13
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **D**

Incorrect register range.

SuggestedRemedy

Change "7.19, 7.22 through 7.27" to be "7.19 through 7.27".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7.6** *P* **57** *L* **12** *MyBallot #* 8
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **D**

Missing period at end of sentence.

SuggestedRemedy

As per comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7.7** *P* **57** *L* **20** *MyBallot #* 11
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **D**

Table 45-121 is in the middle of the paragraph.

SuggestedRemedy

Move table anchor to end of paragraph to take the table out of the paragraph.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7.11.2** *P* **62** *L* **23** *MyBallot #* 14
BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **D**

Change present tense to past tense in two locations.

SuggestedRemedy

Change text "mode of operation is selected" to "mode of operation has been selected" in both locations in the paragraph (one for master, one for slave).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **28B** *SC* **28B.2** *P* **70** *L* **6** *MyBallot #* 5
LAW, DAVID J Individual

Comment Type **TR** *Comment Status* **D**

Subclause 28.2.1.2.2 'Technology Ability Field' now defines the technology ability field as only 7 bits, A0 through A6, with the A7 bit being removed and redefined as Extended Next Page (XNP) bit (see subclause 28.2.1.2.3). Based on this all mention of bit A7 should have been removed from Annex 28B.

SuggestedRemedy

Remove all mention of of bit A7 from this Annex.

Proposed Response *Response Status* **W**

Either
1) defer to the next revision of 802.3

or
2) make the following changes (see attached PDF showing the proposed changes).
- Delete the two "new" paragraphs in 28B.2. (page 70, lines 9 through 18)
- Delete the change to Table 28B-1, that modified bit A7. (page 70, lines 20 through 28)

- Change text in 28B.2 (2005 edition page 596) to "The Technology bit field consists of bits D5 through D11 (A0-A6, respectively)..."
- Remove the row containing bit A7 from table 28B-1

Cl **55** *SC* **55.5.2** *P* **134** *L* **28** *MyBallot #* 9

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **D**

Table 55-8. Table text font is too large.

SuggestedRemedy

Reduce font size.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **55** *SC* **55.7.2.4.4** *P* **149** *L* **23** *MyBallot #* 15

KOEMAN, HENRIECUS Individual

Comment Type **E** *Comment Status* **D**

The explanation provided is unneeded, and the presence is in fact inconsistent: for other parameters the ratio of input and output is not discussed or shown. The text contains also the possible issue that peak voltage is not appropriate; instead signal power is to be used. The only equation that is needed is the one that computes the ELFEXT. There is no practical change in technical requirements or contents.

SuggestedRemedy

Replace lines 23 through 44 with: ELFEXT is defined in Equation (55-17) as ELFEXT(f) = FEXT_loss(f) - SLS_Loss(f) (dB) where FEXT_loss(f) is the measured FEXT frequency response SLS_Loss is the insertion loss of the disturbed channel in dB.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The text is identical to 1000BASE-T and provides useful information on the ELFEXT parameter.

Cl **55** *SC* **55.7.3.1.2** *P* **153** *L* **40** *MyBallot #* 16

KOEMAN, HENRIECUS Individual

Comment Type **E** *Comment Status* **D**

The PS ANEXT constants depend on "length" and not on "distance".

SuggestedRemedy

Replace in the column header of Table 55-14 "distance" with "length".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Link segment distance is used consistently throughout and consistent with other 10GbE phys (e.g., operating distance for fiber).

Cl **55** *SC* **55.7.3.2.1** *P* **155** *L* **10** *MyBallot #* 17

KOEMAN, HENRIECUS Individual

Comment Type **E** *Comment Status* **D**

The scaling is based on length which is independent of frequency. All formulas show parameters with a frequency response property as having a "(f)". One such parameter is in fact IL in equation (55-29), which does not have such frequency dependency shown. It may in fact be simpler to take just one value @ 250 MHz to avoid slightly varying ratios. There is no practical change in requirements as a result of this proposed change.

SuggestedRemedy

Include in equation (55-29) the ratio of DisturbedILN@250MHz and CoupledLengthILi,j,N@250MHz. (I could not format using subscripting - I hope this is clear!)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

During the WG discussion on comment resolution which resulted in this text, the WG decided not to include the IL at a specific frequency.

Cl **55** *SC* **55.7.3.2.2** *P* **157** *L* **21** *MyBallot #* 18

KOEMAN, HENRIECUS Individual

Comment Type **E** *Comment Status* **D**

The PS AELFEXTEXT constants depend on "length" and not on "distance".

SuggestedRemedy

Replace in the column header of Table 55-16 "distance" with "length".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Link segment distance is used consistently throughout and consistent with other 10GbE phys (e.g., operating distance for fiber).

Cl **55** *SC* **55.7.3.3** *P* **162** *L* **16** *MyBallot #* 19

KOEMAN, HENRIECUS Individual

Comment Type **E** *Comment Status* **D**

Equation (55-48) is the incorrect reference. (Oversight!) Should be (55-51).

SuggestedRemedy

Instead of (55-48) use (55-51).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **55** *SC* **55.8** *P* **164** *L* **1** *MyBallot #* 10

BOOTH, MR BRAD J Individual

Comment Type **E** *Comment Status* **D**

Top of page break associated with 55.8.

SuggestedRemedy

Change to make text continuous.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **55** *SC* **55.3.2.2.18** *P* **101** *L* **49** *MyBallot #* 33

TELLADO, JOSE Individual

Comment Type **E** *Comment Status* **D**

DSQ128 has two dimensions/components which are labeled DSQ_1 and DSQ_2 which are PAM16 symbols.

SuggestedRemedy

Since each dimension of the DSQ128 are PAM16 symbols, replace all instances of DSQ128_1 for PAM16_1 and DSQ128_2 for PAM16_2 to indicate the first and second component of the DSQ128. Same with DSQ_1 and DSQ_2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **55** *SC* **55.4.2.5.1** *P* **117** *L* **36** *MyBallot #* 31

UNGERBOECK, GOTTFRIED Individual

Comment Type **E** *Comment Status* **D**

It is not appropriate to define the eight PBO values under the heading "InfoField notation", and then again in 55.4.5.1 three times!

SuggestedRemedy

Delete 55.4.2.5.1 entirely unless more appropriate text can be provided under this heading.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Subclause 55.4.2.5.1 is required since it defines Reseved bits and describes the ordering of bits and octets in the InfoField. The PBO bits are used in several fields and defining here reduces text

Cl **55** *SC* **55.4.2.5.4** *P* **118** *L* **12** *MyBallot #* 27

UNGERBOECK, GOTTFRIED Individual

Comment Type **T** *Comment Status* **D**

In the now much simplified startup sequence only one PBO exchange can occur. Moreover, the link partner *must* change its current PBO setting to the requested PBO setting. There appears to be no logical necessity for sending 'Next transmitter settings' (next PBO). (Initially, this commenter thought that a link partner may be given more freedom in selecting the next PBO setting).

SuggestedRemedy

Remove 'Next transmitter settings' from the InfoField unless there is a good technical justification for keeping it. Keeping unnecessary provisions in a standard does not "break" a standard, but it breaks the confidence of others in the creators of the standard.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The Next transmitter setting is used to confirm to the link partner the Next PBO to be used.

Cl **55** *SC* **55.4.2.5.6** *P* **118** *L* **33** *MyBallot #* 22

UNGERBOECK, GOTTFRIED Individual

Comment Type **T** *Comment Status* **D**

The introduction of two PMA_state bits in the message field of Draft 3.2 has made retention of three separate message-field bits trans_to_Coeff_Exch, trans_to_Fine_Adjust, and trans_to_PCS_Test unnecessary. A single bit trans_to_next_state is sufficient. The next state follows from the PMA_state bits.

SuggestedRemedy

Replace trans_to_Coeff_Exch, trans_to_Fine_Adjust, and trans_to_PCS_Test by one bit trans_to_next_state. (Not even this bit is needed as will be seen in the next comment).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The transition bits are currently required to control transitions in the state diagrams PHY Control (55-24) Master transition counter (55-25) and Slave transition counter (55-26).

Cl **55** *SC* **55.4.2.5.14** *P* **121** *L* **39** *MyBallot #* 32

UNGERBOECK, GOTTFRIED Individual

Comment Type **E** *Comment Status* **D**

The state names PMA_Training_Init_M and PMA_Training_Init_S are unnecessarily long.

SuggestedRemedy

Use PMA_Training_M and PMA_Training_S.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The phrase 'Init' is used to differentiate the Initial PMA training that occurs in this state vs the Fine training that occurs in state "PMA_Fine_Adjust".

Cl **55** *SC* **55.4.2.5.14** *P* **122** *L* **15** *MyBallot #* 23

UNGERBOECK, GOTTFRIED Individual

Comment Type **T** *Comment Status* **D**

In Draft 3.2 the purpose of the transition counter has been reduced to the irrevocable announcement of state transitions. To announce a state transition it suffices to insert in the InfoFields a non-zero transition_count, which is decreased by one in successive InfoFields. The three message-field bits trans_to_..., or an equivalent single bit trans_to_next_state, are not needed. The state transition should be defined to occur immediately after the InfoField containing transition_count = 1. The InfoField of the next PMA training frame should then exhibit the new PMA_state bits and transition_count should be zero and remain zero until the next state transition is announced (subtle distinction: transition_counter is a state variable; transition_count is a sub-field of the InfoFields; the two objects are not the same; transition_counter always exists; transition_count exists only within an InfoField).

SuggestedRemedy

(a) Eliminate trans_to_Coeff_Exch, trans_to_Fine_Adjust, and trans_to_PCS_Test from the mes-sage field.
(b) Define in 55.4.5.1 state variable transition_counter as follows:
transition_counter
A 10-bit counter variable whose value is communicated to the remote PHY in the transition_count subfield of InfoFields when in transition-counter format. To announce a state transition to the link partner, the PHY sets transition_counter to a non-zero value. The value is decremented by one after each transmission of an InfoField until the value zero is reached. The announced state transition occurs immediately after transmission of the InfoField containing transition_count = 1.
Values: 0 - 2^9? (See further comment).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The state transition occurs in the PMA Training frame immediately after the InfoField containing transition_count = 0 (not =1 as indicated by the comment), as shown in page 122, line 20 and Figs 55-24, 55-25 and 55-26.

Eliminating the transition_to_ bit will also prevent the transition counter from being used for other purposes when transition_to = 0 and thus prevents future use.

Cl **55** *SC* **55.4.5.1** *P* **126** *L* **18** *MyBallot #* 26

UNGERBOECK, GOTTFRIED Individual

Comment Type **T** *Comment Status* **D**

The variables loc_rcvr_status and loc_SNR_margin have similar meanings, indicating readiness of the local receiver for allowing PHY Control continue to the next sequential state. loc_SNR_margin is used only in states PMA_Training_Init_M/S and is not communicated to the link partner. loc_rcvr_status is used only in state PCS_Test and is communicated via message-field bit loc_rcvr_status to the link partner (remark: same name for a state variable and a bit-field in the InfoField). A more uniform concept should be adopted as given below. This not only simplifies the standard, but also improves testability and handling of error situations.

SuggestedRemedy

Retain only loc_rcvr_status and use the following definition.
loc_rcvr_status
This 1-bit variable indicates whether the local receiver operates correctly with sufficient SNR margin to continue to the next state or states. The variable is always communicated to the link partner in message-field bit loc_rcvr_status. When entering a new state, loc_rcvr_status shall be reset to NOT_OK even if the local receiver operates correctly. Setting loc_rcvr_status to OK represents an affirmative action that confirms (or reconfirms) readiness of the local receiver for a transition to the next state.
Values: OK or NOT_OK (simpler NOK).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

These two variables have two distict functions.
Loc_rcvr_status is used to indicate the overall receive link is satisfactory for data operation (DSQ128). Loc_SNR_margin is used to indicate that the SNR margin is sufficient to transition to the next PMA training (PAM2) state

Cl **55** *SC* **55.4.5.1** *P* **128** *L* **15** *MyBallot #* 25

UNGERBOECK, GOTTFRIED Individual

Comment Type **T** *Comment Status* **D**

Transition_counter is represented with 10 bits only to support the MASTER's initial value of 2^9 = 512. For an initial value of 511 9 bits would be sufficient. Such nasty little bit wastes can make joyful readers of a supposedly well conceived IEEE standard only angry.

SuggestedRemedy

Reduce transition_counter and InfoField subfield transition_count to 9 bits, hence: Values: 0 - 511. --- Alternatively, keep 10 bits and provide additional flexibility. Instead of a fixed initial value of 2^9 for the MASTER and a matching value of >2^6 for the responding SLAVE, let the values corresponding to 2^9 and 2^6 be determined during Auto Negotiation, with values up to 1023.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

There is no need to make the initial value of transition_counter value programmable and determined during Auto-Negotiation. Starting the counter at 2^9 is simpler then starting at 2^9-1. The extra bit would become Reserved and there are currently many reserved bits.

Cl **55** *SC* **55.4.5.1** *P* **128** *L* **7** *MyBallot #* 24

UNGERBOECK, GOTTFRIED Individual

Comment Type **E** *Comment Status* **D**

The current definition of transition_counter is loaded with details on the use of the transition counter by MASTER and SLAVE. This description should better be given elsewhere.

SuggestedRemedy

Describe how transition_counter is employed by MASTER and SLAVE in section 55.4.2.5.14 Startup sequence.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The description of transition_counter is included in 55.4.2.5.14: page 122, line 13

Cl **55** *SC* **55.1** *P* **78** *L* **24** *MyBallot #* 28

UNGERBOECK, GOTTFRIED Individual

Comment Type **E** *Comment Status* **D**

Which management?

SuggestedRemedy

Write: The 10GBASE-T Management is specified in Clause 30.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

The change is not essential - "which" can be inferred from the previous text.

Cl **55** *SC* **55.1.1** *P* **78** *L* **28** *MyBallot #* 29

UNGERBOECK, GOTTFRIED Individual

Comment Type **E** *Comment Status* **D**

Bad sequence of words.

SuggestedRemedy

Write: The objectives of 10GBASE-T are as follows.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **55** *SC* **55.1.1** *P* **78** *L* **45** *MyBallot #* 30

UNGERBOECK, GOTTFRIED Individual

Comment Type **E** *Comment Status* **D**

Support a BER?... for all supported distances and Classes?

SuggestedRemedy

Write: Achieve a BER of less than or equal to 10^-12 for the link-segment characteristics specified for 10GBASE-T.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.