The definition of registers 1.2316 and 1.2317 is not being done in accordance with Clause 45 conventions or in keeping with "user defined data" as used in prior BASE-T PHYs. The names of the registers are such that when this amendment has been applied to the base standard it will not be clear what they are for.

**Suggested Remedy**

- In Table 45-3: Change the name of register 1.2316 to "MultiGBASE-T1 user defined data" in subclause 45.2.1.199
- Change the name of register 1.2317 to "MultiGBASE-T1 link partner user defined data" in subclause 45.2.1.200
- In 45.2.1.199: Change the title to: "MultiGBASE-T1 user defined data register (Register 1.2316)"
- Change the text to: "The assignment of bits for the MultiGBASE-T1 user defined data register is shown in Table 45–155f. The values of the bits in this register are all zeros unless the PHY identifies the link partner during Auto-Negotiation through communicating OUIs using the NEXT pages."
- In Table 45–155f: Change the title to: "MultiGBASE-T1 user defined data register bit definitions" Change the Name to: "MultiGBASE-T1 user defined data" Change the Description to: "16 bits of vendor specific data that the PHY sends to its link partner during Auto-Negotiation through communicating OUIs using the NEXT pages."
- Delete the last row of the table. Change footnote a to "R/W = Read/Write"
- In 45.2.1.199.1: Change text to: "Bits 1.2316.15:0 contain vendor specific data that the PHY may communicate to its link partner during training."
- Delete 45.2.1.199.2
- Create a new level 4 subclause: "45.2.1.200 MultiGBASE-T1 link partner user defined data register (Register 1.2317)" with text:
  "The assignment of bits for the MultiGBASE-T1 link partner user defined data register is shown in Table 45–155g. The values of the bits in this register are outside the scope of this standard."
- Create Table 45–155g with title "MultiGBASE-T1 link partner user defined data register bit definitions" and a row with Name entry for 1.2317.15:0 is "Link partner PHY vendor specific data", Description is "16 bits of vendor specific data that the PHY may receive from its link partner", R/W is "RO", and footnote a is "RO = Read only"
- Create a new level 5 subclause: "45.2.1.200.1 Link partner PHY vendor specific data (1.2317.15:0)" with text "Bits 1.2317.15:0 contain vendor specific data that the PHY may receive from its link partner during training."

**Response**

ACCEPT IN PRINCIPLE.
### 32.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

#### Comment 1

**Comment ID:** 45  
**SC:** 45.2.1.18  
**Page:** 3  
**Line:** 24  
**Status:** A  
**Type:** E

**Comment:**

Add is not a valid editing instruction. Table 45-21 is not being changed, so should not be shown. Notes should use the paragraph tag "Note".

**Suggested Remedy:**

- Change the editing instruction to: "Insert the following note below Table 45-21:"
- Delete Table 45-21.
- Apply Paragraph tag "Note" to the note.

**Response:**

Accept.

#### Comment 2

**Comment ID:** 45  
**SC:** 45.2.1.196.2  
**Page:** 41  
**Line:** 50  
**Status:** A  
**Type:** E

**Comment:**

The convention used in Clause 45 for the values of pairs of bits is to not include a space between them.

**Suggested Remedy:**

- Change "value of 0 0" to "value of 00"
- Change "value of 0 1" to "value of 01"
- Change "value of 1 0" to "value of 10"

**Response:**

Accept.

#### Comment 3

**Comment ID:** 45  
**SC:** 45.5.3.3  
**Page:** 54  
**Line:** 8  
**Status:** A  
**Type:** E

**Comment:**

The highest inserted item is MM231.

**Suggested Remedy:**

Change "through MM227" to "through MM231"

**Response:**

Accept.

#### Comment 4

**Comment ID:** 78  
**SC:** 78.2  
**Page:** 58  
**Line:** 53  
**Status:** A  
**Type:** E

**Comment:**

The bottom ruling of Table 78-2 should not be "Very Thin"

**Suggested Remedy:**

Remove the override for the bottom ruling of Table 78-2

**Response:**

Accept.
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

---

**Comment 78**  
**SC 78.5**  
**P 59**  
**L 17**  
### Anslow, Pete Ciena  
**Comment Type** E  
**Comment Status** A  

"Insert an 10th paragraph" should be "Insert a 10th paragraph"  
**Suggested Remedy**  
Change "an" to "a"  

**Response**  
**Response Status** C  
ACEPT.

---

**Comment 104**  
**SC 104.9**  
**P 68**  
**L 1**  
### Anslow, Pete Ciena  
**Comment Type** E  
**Comment Status** A  

The two items *PSETE and *PDTE are being inserted by IEEE Std 802.3cg-20xx. The redundant editing instruction at the top of the page (proposed to be deleted in another comment) does not change the fact that this editing instruction should include this.  
**Suggested Remedy**  
Change "in the table in 104.9.3 as follows" to "in the table in 104.9.3 (as modified by IEEE Std 802.3cg-20xx) as follows"  

**Response**  
**Response Status** C  
ACEPT.

---

**Comment 149**  
**SC 149.3.2.2.2**  
**P 93**  
**L 52**  
### Anslow, Pete Ciena  
**Comment Type** E  
**Comment Status** A  

Figures 149-6 and 149-7 now contain two notes each. When there is more than one note, the IEEE-SA Standards Style Manual includes "Multiple notes in sequence should be numbered "NOTE 1—", "NOTE 2—", etc." Also, there should be no spaces either side of the em-dash.  
**Suggested Remedy**  
In Figures 149-6 and 149-7:  
Change "Note — This" to "NOTE 1—This"  
Change "Note — Figure" to "NOTE 2—Figure"  

**Response**  
**Response Status** C  
ACEPT.

---

**Comment 149**  
**SC 149.3.9.2.13**  
**P 130**  
**L 6**  
### Anslow, Pete Ciena  
**Comment Type** E  
**Comment Status** A  

Figure 149-23 has been changed so that the coefficient "A2 = 1" is adjacent to an arrow that just points to another line. Previously, this was an input to a multiply function. In this version of the figure it is unclear what function is performed with "A2 = 1"  
**Suggested Remedy**  
If the intent is to simply multiply by 1, then reinstate the multiply symbol. If the intent is different from this then clarify what it is.  

**Response**  
**Response Status** C  
ACEPT IN PRINCIPLE.  
Remove arrows from all "A_x" and just put the name by the symbol/line as is done in Figure 149-10.

---

TYPE: TR/technical required  
ER/editorial required  
GR/general required  
T/technical  
E/editorial  
G/general  

COMMENT STATUS: D/dispatched  
A/accepted  
R/rejected  
RESPONSE STATUS: O/open  
W/written  
C/closed  
U/unsatisfied  
Z/withdrawn  

SORT ORDER: Comment ID  

Comment ID 14  
Page 3 of 45  
9/12/2019 2:10:20 PM
In state diagrams, the transitions shouldn't include "=true" or "=false", instead you should have the variable_name for true and !variable_name for false.

Suggested Remedy

In Figure 149-32, change the following:

L25, L31: "send_s_ssigdet = false" to "!send_s_ssigdet"
L39: "power_on = true" to "power_on"
L40: "mr_main_reset = true" to "mr_main_reset"
L40: "mr_autoneg_enable = true" to "mr_autoneg_enable"
L49: "mr_autoneg_enable = false" to "!mr_autoneg_enable"

Response

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the suggested change to match the IEEE802 style. In addition, correct the spelling of send_s_ssigdet.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the suggested change to match the IEEE802 style.
In state diagrams, the transitions shouldn't include "=true" or "=false", instead you should have the variable name for true and !variable_name for false.

**Suggested Remedy**

In Figure 149-3, change the following:
- L2: "auto_neg_imp = true" to "auto_neg_imp"
- L2: "mr_autoneg_enable = true" to "mr_autoneg_enable"
- L4: "auto_neg_imp = false" to "auto_neg_imp"
- L4: "mr_autoneg_enable = false" to "mr_autoneg_enable"
- L12: "pcs_data_mode = true" to "pcs_data_mode"

**Response**

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the suggested change to match the IEEE802 style.

In state diagrams, the transitions shouldn't include "=true" or "=false", instead you should have the variable name for true and !variable_name for false.

**Suggested Remedy**

In Figure 149B-2, change the following:
- L15 & L28: "mr_rx_clear_rec=true" to "mr_rx_clear_rec"
- L28: "mr_rx_clear_rec=false" to "!mr_rx_clear_rec"

**Response**

ACCEPT.

In state diagrams, the transitions shouldn't include "=true" or "=false", instead you should have the variable name for true and !variable_name for false.

**Suggested Remedy**

In Figure 149B-3, change the following:
- L44: "mr_tx_request_rec_clear= true" to "mr_tx_request_rec_clear"
- L50: "mr_rx_rec_cleared = true" to "mr_rx_rec_cleared"

**Response**

ACCEPT IN PRINCIPLE.

In Figure 149B-3, change the following:
- L44: "mr_tx_request_rec_clear = true" to "mr_tx_clear_rec"
- L50: "mr_rx_rec_cleared = true" to "mr_rx_rec_cleared"
Comment ID 22

Wienckowski, Natalie  General Motors

Comment Type  E  Comment Status  A  Precoder

What is "PAM4 mode"?

Suggested Remedy
Change: PAM4 mode
To: PAM4 encoding

Response  Response Status  C  ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the following change to increase reader understanding.

Change: when entering PAM4 mode
To: when transitioning to PAM4 encoding

Comment ID 23

Wienckowski, Natalie  General Motors

Comment Type  E  Comment Status  A

Questions:  Make "Table 104-7" a hyperlink.
Also, P67 L4

Response  Response Status  C  ACCEPT.

Comment ID 24

Wienckowski, Natalie  General Motors

Comment Type  E  Comment Status  A

Questions:  Make "Table 104-7" a hyperlink and remove the "forrest green" color.
Also, P67 L6, P67 L11, P67 L14.

Response  Response Status  C  ACCEPT.

Comment ID 25

Wienckowski, Natalie  General Motors

Comment Type  E  Comment Status  A

Questions:  Make "78" a hyperlink.

Response  Response Status  C  ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Correct the link to improve readability of the draft.

Comment ID 27

Wienckowski, Natalie  General Motors

Comment Type  E  Comment Status  A

Questions:  Change 149B
To: Annex 149B

Response  Response Status  C  ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Correct the link to improve readability of the draft.
SuggestedRemedy
Make "Table 149-11" in Feature column a hyperlink.

Response
Response Status C
ACCEPT.

Comment Type E  Comment Status A  EZ

SuggestedRemedy
Make "Table 149-10" in Feature column a hyperlink.

Response
Response Status C
ACCEPT.

Comment Type E  Comment Status A  EZ

SuggestedRemedy
Make "Table 149-32" in Feature column a hyperlink.

Response
Response Status C
ACCEPT.

Comment Type E  Comment Status A  EZ
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

**Comment 149**

**SC 149.11.4.6**

P189  L27  # 54

Wienckowski, Natalie  General Motors

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

**Suggested Remedy**

Make "149.5.2" in Feature column a hyperlink.

**Response**  **Response Status** C  EZ

**ACCEPT.**

**Comment 149**

**SC 149.11.4.6**

P189  L28  # 55

Wienckowski, Natalie  General Motors

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

**Suggested Remedy**

Make "149.5.3" in Feature column a hyperlink.

**Response**  **Response Status** C  EZ

**ACCEPT.**

**Comment 149A**

**SC 149A.5.4**

P197  L41  # 56

Wienckowski, Natalie  General Motors

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

**Suggested Remedy**

Make "Figure 149A–3" in Feature column a hyperlink.

**Response**  **Response Status** C  EZ

**ACCEPT IN PRINCIPLE.**

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Correct the link to improve readability of the draft.

**Comment 39**

**SC 104.9.4.3**

P69  L17  # 59

Wienckowski, Natalie  General Motors

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

**Suggested Remedy**

Make "Clause 97" a hyperlink and remove the "forrest green" color.

**Response**  **Response Status** C  EZ

**ACCEPT.**

**Comment 149C**

**SC 149C.1**

P203  L11  # 58

Wienckowski, Natalie  General Motors

**Comment Type** T  **Comment Status** D  149C

149C has no information on return loss

**Suggested Remedy**

Change: provides information on insertion loss parameters

To: provides information on insertion loss parameters

**Proposed Response**  **Response Status** Z  REJECT.

This comment was WITHDRAWN by the commenter.

**Comment 39**

**SC 104.9.4.3**

P69  L17  # 59

Wienckowski, Natalie  General Motors

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

**Suggested Remedy**

Make "Clause 97" a hyperlink and remove the "forrest green" color.

**Response**  **Response Status** C  EZ

**ACCEPT.**
This amendment to IEEE Std 802.3-2018 adds physical layer specifications and management parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s operation on a single balanced pair of conductors suitable for automotive applications."

Suggested Remedy
Change to:
"This amendment to IEEE Std 802.3-2018 adds physical layer specifications and management parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s operation on a single balanced pair of conductors suitable for automotive applications."

Response
ACCEPT IN PRINCIPLE.

The word "corrupted" was accidentally deleted from the end of the sentence. Add it back per comment #100.

Suggested Remedy
Change title to:
"Draft Standard for Ethernet Amendment: Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s and 10 Gb/s Automotive Electrical Ethernet"

Also consider changing page headers to something other than "IEEE P802.3ch Multi-Gig Automotive Ethernet PHY Task Force"
perhaps change to: "IEEE P802.3ch Task Force: Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s and 10 Gb/s Automotive Electrical Ethernet"

Response
ACCEPT IN PRINCIPLE.

Change title to match the first page adding missing comma: "Draft Standard for Ethernet Amendment: Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Automotive Electrical Ethernet"

Don't change the page header as it is supposed to be the Task Force name.
Actual precoder requested doesn't really make any sense to me based upon description. I believe this field should be indicating the actual state/control of the receive precoder.

Suggested Remedy
See Presentation tu_3ch_01_0919.pdf

ACCEPT IN PRINCIPLE.

This comment has the same response as #123.

Make the following changes:
Page 37 line 21 (Table 45-155b) change "Actual precoder requested" to "PrecodeSel"
Page 38 line 8 (45.2.1.193.5 header) change "Actual precoder selected" to "PrecodeSel",
and replace text of 45.2.1.193.5 (P38 lines 10-12) to read as follows:
"Bits 1.2310.4:3 contain the requested precoder setting communicated by the PHY to the link partner via the PrecodeSel bits in the Infofield (see 149.4.2.4.4)."

Page 39 line 15 (Table 45-155c) and Page 38 line 45 (45.2.1.194.2 header) change "Precoder request override" to "Precoder Selection", and replace text (P38 lines 47-48) to read as follows:
"When 1.2311.5 is set to a one, the PHY shall use 1.2311.3:2 for the value of PrecodeSel, and when set to a zero the PHY controls the value of PrecodeSel. PrecodeSel is the desired precoder setting communicated to the link partner via the Infofield specified in 149.4.2.4.4."

Page 39 line 23 (Table 45-155c) and Page 39 line 37 (45.2.1.194.4 header) change "Precoder requested" to "User precoder selection", and replace text (P39 lines 38-39) to read as follows:
"When 1.2311.5 is a one, bits 1.2311.3:2 are the requested precoder setting communicated by the PHY to the link partner via the PrecodeSel bits in the Infofield (see 149.4.2.4.4)."

The precoder_type is suppose to be assigned to two bits from the InfoFields, which contains 96 bits of information. So which 2 bits should be used?

Suggested Remedy
Change "two bits in the InfoField messages" to "the PrecodeSel field from the InfoField messages (see 149.4.2.4.5)"

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the requested change to increase reader understanding.

The most common transmitter connection to an oscilloscope utilizes two 50-ohm channels. Figure 149-36 should be updated.

Suggested Remedy
Recommned new figure 149-36

ACCEPT IN PRINCIPLE.

Replace Figure 149-36 with the figure in gubow_3ch_01a_0919.pdf.
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: D  
**Suggested Remedy**:  
Remove the gaps in all the numbers in column 2.

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
RS-FE should be RS_FEC

---

Lo, William  
Axonne Inc.

**Comment Type**: T  
**Comment Status**: D  
**Suggested Remedy**:  
Table fix gap in column 3 numbers

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Font size of text in boxes and text in arrows are not consistent

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make font sizes of text consistent

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

---

Lo, William  
Axonne Inc.

**Comment Type**: T  
**Comment Status**: D  
**Suggested Remedy**:  
"may overlap" to "mostly will not overlap"

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: D  
**Suggested Remedy**:  
Remove the gaps in all the numbers in column 3.

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Font size of text in boxes and text in arrows are not consistent

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make font sizes of text consistent

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

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Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

---

Lo, William  
Axonne Inc.

**Comment Type**: E  
**Comment Status**: A  
**Suggested Remedy**:  
Make all text size 8 to be consistent.

---

Lo, William  
Axonne Inc.
Cannot condense into 1 variable (mGigT1). If one device can do 2.5G only and another

Can 10G only how would the incompatible link work as both would assert mGigT1?

Fixing the footnote in page 156 is the proper way to address D2.0 comment 224.

SuggestedRemedy

Undo changes from D2.0 comment 224
Page 156 line 22 change
link_control_mGigT1 and link_status_mGigT1 to
link_control_mGigT1 and link_status_mGigT1 where mGigT1 is 2.5GigT1, 5GigT1, or
10GigT1.

Response Response Status C
ACCEPT IN PRINCIPLE.

Undo changes from D2.0 comment 224
P156 L22 change: The variables link_control and link_status are designated as
link_control_mGigT1 and link_status_mGigT1, respectively.

To: The variables link_control and link_status are designated as link_control_2.5GigT1 and
link_status_2.5GigT1 for 2.5GBASE-T1, link_control_5GigT1 and link_status_5GigT1 for
5GBASE-T1, and link_control_10GigT1 and link_status_10GigT1 for 10GBASE-T1.

Fix corner case out of sync condition between Figure 149-17 and 149-20
Scenario:
LPI is send at the initial RS frame just as lp_low_snr=1
TX_L state is entered and tx_lpi_req never gets set to true
Stuck in TX_L state since it is waiting for tx_lpi_active to go true.
Meanwhile in Figure 149-20 stuck at TX_NORMAL since tx_lpi_req remains false
so never enters into SEND_SLEEP to set tx_lpi_active to true.
So we are deadlocked Figure 149-17 waiting for tx_lpi_active to go true
while Figure 149-20 is waiting for tx_lpi_req to go true.
Remedy below breaks the deadlock.

SuggestedRemedy

Change:
(lp_low_snr + T_TYPE(tx_raw) = (C + D + E + S + T ) \* tx_lpi_active
To:
(lp_low_snr + T_TYPE(tx_raw) = (C + D + E + S + T ) \* (!tx_lpi_req + tx_lpi_active)

Response Response Status C
ACCEPT.

Correct text for space circuit

SuggestedRemedy

correct text for space circuit

Response Response Status C
ACCEPT IN PRINCIPLE.

Change *circ uit* to *circuit*
DiMinico, Christopher  
MC Communications

Comment Type: T  
Comment Status: A  

149C

Response

ACCEPT IN PRINCIPLE.

In addition to the length change, the lengths were changed to SI units, mm.

DiMinico, Christopher  
MC Communications

Comment Type: TR  
Comment Status: A  

149C

Response

ACCEPT IN PRINCIPLE.

Add the text proposed in diminish_3ch_02c_0919.pdf with editorial license to conform to IEEE 802.3 style.

DiMinico, Christopher  
MC Communications

Comment Type: E  
Comment Status: A  

149C

Response

ACCEPT IN PRINCIPLE.

Add: IEEE Std 802.3cq™-20xx
Amendment 6—This amendment includes editorial and technical corrections, refinements, and clarifications to Clause 33 and related portions of the standard.

Response

ACCEPT.
IEEE Std 802.3cm™-20xx - Amendment 7

Add: IEEE Std 802.3cm™-20xx - Amendment 7

Amendment 7—This amendment includes changes to IEEE Std 802.3-2018 and adds

Clause 150. This amendment adds

Physical Layer (PHY) specifications and management parameters for 400 Gb/s operation

on four pairs (400GBASE-SR4.2) and eight pairs (400GBASE-SR8) of multimode fiber,

over reaches of at least

100 m.

In the equation defined by parts (149–22). The frequency point 480/2N belongs only to the

first part. The frequency point 3000 belongs to the second and third part. This is not

consistent.

Change the second part "480/2N ≤ f ≤ 3000 MHz" to "480/2N ≤ f < 3000"

This comment does not apply to the substantive changes between IEEE P802.3ch

D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it

is not within the scope of the recirculation ballot.

Make change to fix typo.

In the equation defined by parts (149–24). The frequency point 750 belongs to the first and

second part.

Change the first part "30 ≤ f ≤ 750 MHz" to "30 ≤ f < 750 MHz"

This comment does not apply to the substantive changes between IEEE P802.3ch

D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it

is not within the scope of the recirculation ballot.

Make change to fix typo.
Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

P802.3ch D2.1  32.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

Tu, Mike  Broadcom

Comment Type  T  Comment Status  A  EEE

After exiting the low-power mode, the PHY should go to either Auto-Negotiation or PHY Link Synchronization, instead of going to Figure 149-33 PHY Control state diagram.

SuggestedRemedy
Delete the entire paragraph.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Delete "The MultiGBASE-T1 PHY executes a full retrain as defined in Figure 149–33 after exiting from reset or low-power mode."

Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
Comment ID: 67  Page 15 of 45  9/12/2019  2:10:22 PM
The "actual precoder selected" name is confusing to readers.

Suggested Remedy

See proposed changes in tu_3ch_01_0919.pdf.

Response

ACCEPT IN PRINCIPLE.

This comment has the same response as #123.

Make the following changes:

Page 37 line 21 (Table 45-155b) change "Actual precoder requested" to "PrecodeSel"

Page 38 line 8 (45.2.1.193.5 header) change "Actual precoder selected" to "PrecodeSel", and replace text of 45.2.1.193.5 (P38 lines 10-12) to read as follows:

"Bits 1.2310.4:3 contain the requested precoder setting communicated by the PHY to the link partner via the PrecodeSel bits in the Infofield (see 149.4.2.4.4)."

Page 39 line 15 (Table 45-155c) and Page 38 line 45 (45.2.1.194.2 header) change "Precoder request override" to "Precoder Selection", and replace text (P38 lines 47-48) to read as follows:

"When 1.2311.5 is set to a one, the PHY shall use 1.2311.3:2 for the value of PrecodeSel, and when set to a zero the PHY controls the value of PrecodeSel. PrecodeSel is the desired precoder setting communicated to the link partner via the Infofield specified in 149.4.2.4.4."

Page 39 line 23 (Table 45-155c) and Page 39 line 37 (45.2.1.194.4 header) change "Precoder requested" to "User precoder selection", and replace text (P39 lines 38-39) to read as follows:

"When 1.2311.5 is a one, bits 1.2311.3:2 are the requested precoder setting communicated by the PHY to the link partner via the PrecodeSel bits in the Infofield (see 149.4.2.4.4)."

"Reed-Solomon 'receiver' interleave setting" does not sound right. Delete the word 'receiver'.

Suggested Remedy

Change from: "… the Reed-Solomon receiver interleave setting …"

To: "… the Reed-Solomon interleave setting …"

Response

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested change and additional change to correct "Infofields" to "InfoField".

Both "local device" and "local PHY" are used in this document. Maybe we should stay with "local PHY"?

Suggested Remedy

Replace all occurrences of "local device" by "local PHY" throughout the document.

Response

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Change "local device" to "local PHY" at the following locations to make the draft consistent:

P41 L5, P41 L12, P46 L8, P55 L45, P55 L49, P153 L40, P153 L43, P153 L44
Comment Type: T
Comment Status: A
Vendor
Register 1.2317 contains the Link partner vendor specific data.

SuggestedRemedy
Under column "Name", change "Reserved" to "Link partner vendor specific data"

Response
Response Status: C
ACCEPT IN PRINCIPLE.

This row is deleted by comment #1.

Comment Type: T
Comment Status: A
Vendor
Need to define the bit mapping of VendorSpecificData.

SuggestedRemedy
Change line 47 from: "Oct8<7:0> = VendorSpecificData, and Oct9<7:0> = VendorSpecificData."
To: "Oct8<7:0> = VendorSpecificData[7:0], and Oct9<7:0> = VendorSpecificData[15:8]."

Response
Response Status: C
ACCEPT.

Comment Type: T
Comment Status: A
Vendor
Need to define the bit mapping of InterleaverDepth and PrecodeSel.

SuggestedRemedy
Change line 45 from: "... PHY capability bits is Oct10<2:1> = InterleaverDepth, Oct10<4:3> = PrecodeSel, ..."
To: "... PHY capability bits is Oct10<2:1> = InterleaverDepth[1:0], Oct10<4:3> = PrecodeSel[1:0], ..."

Response
Response Status: C
ACCEPT.

Comment Type: T
Comment Status: D
EZ
PMA_Link.request can be set by either the Auto-Negotiation or the PHY Link Synchronization.

SuggestedRemedy
Change line 24 and 25 to:
DISABLE Used by the Auto-Negotiation or PHY Link Synchronization function to disable the PHY.
ENABLE Used by the Auto-Negotiation or PHY Link Synchronization function to enable the PHY.

Proposed Response
Response Status: Z
REJECT.

This comment was WITHDRAWN by the commenter.
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

PMA_Link.request can be set by either the Auto-Negotiation or the PHY Link Synchronization.

Suggested Remedy

Change start of this sentence from: "Auto-Negotiation generates ..."
To: "Auto-Negotiation or PHY Link Synchronization generates ..."

This comment was WITHDRAWN by the commenter.

PMA_Link.indication also goes to the PHY Link Synchronization.

Suggested Remedy

Change from: "... and the Auto-Negotiation functions ...
To: "... and the Auto-Negotiation or PHY Link Synchronization function ..."

This comment was WITHDRAWN by the commenter.

The effect of receipt of this primitive is specified in 98.4.1.

Suggested Remedy

Change from:
"The effect of receipt of this primitive is specified in 98.4.1."
To:
"The effect of receipt of this primitive is specified in 98.4.1 for Auto-Negotiation, and in 149.4.2.6.4 for PHY Link Synchronization."

This comment was WITHDRAWN by the commenter.

Conceptually the interleaving is done prior to or at the same time with the RS-FEC encoding. Also there is a typo on this line: "RS-FE symbols" should be "RS-FEC symbols".

Suggested Remedy

Change this sentence from: "... OAM field, then add 340 bits of parity for the RS-FEC, interleave the RS-FE symbols, ...
To: "... OAM field, then interleave and add 340 bits of parity for the RS-FEC, ...

This comment was WITHDRAWN by the commenter.

Add a reference to 149.4.2.6.4 PHY Link Synchronization State Diagram.

Suggested Remedy

Change from: "... OAM field, then add 340 bits of parity for the RS-FEC, interleave the RS-FE symbols, ...
To: "... OAM field, then interleave and add 340 bits of parity for the RS-FEC, ...

This comment was WITHDRAWN by the commenter.

Delete this sentence per comment #156

Accept In Principle.
Change "3600 bits" to "3600xL bits", and change "1800 PAM4 symbols" to "1800xL PAM4 symbols".

Accept In Principle.
Delete this sentence per comment #156
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

The block diagram is "shown" in Figure 149-5.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the following change to be consistent with wording used throughout this draft.
Change: A block diagram of the PCS Transmit functions is shown in Figure 149–5.
To: A block diagram of the PCS Transmit function is shown in Figure 149–5.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Should we use "MultiGBASE-T1" instead of "2.5G/5G/10GBASE-T1"?

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

"tx_RSmessage<3259:0> prior to additive scrambling is formed as follows."
To: "tx_RSmessage<3259:0> prior to the RS-FEC (360,326) encoder is formed as follows."
Also add indents at line 12 and line 14.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

This needs to be carefully reviewed to see if this has any other impacts.
2.5G/5G/10GBASE-T1 was intentionally left in the draft in some places.

Commenter is encouraged to resubmit this comment at SA ballot if it is deemed not to impact the draft.
## 2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autm

### Comment ID 149  SC 149.3.2.2.18  P101  L42  #85

**Comment Type:** T  **Comment Status:** A  **Terminology**  

Use "n" as the common index of symbol numbers in time, in 149.3.2.2.18, 149.3.2.2.19, 149.3.2.2.20, and 149.3.2.2.21.

**SuggestedRemedy**

1. On page 101, line 35, insert a new paragraph as follows:
   "n is an index indicating the symbol number".

2. In in 149.3.2.2.18, 149.3.2.2.19, 149.3.2.2.20, and 149.3.2.2.21, applying the following changes:
   2.1 Change all bit notation "A" to "A_n", where "," means subscript formatting.
   2.2 Change all bit notation "B" to "B_n", where "," means subscript formatting.
   2.3 Change all "G(j)" to "G(n)".
   2.4 Change all "P(j)" to "P(n)"; all "P(j-1)" to "P(n-1)", and "P(j-2)" to "P(n-2)".
   2.5 Change "M(u)" to "M(n)".
   2.5 Change "P(u)" to "P(n)".

3. Change page 103, line 6 from "The PAM4 encoded symbols are denoted M(u), where:" to "The PAM4 encoded symbols are denoted M(n)."

4. Delete page 103, line 8.

**Response**

**Response Status:** C  

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the changes requested in tu_3ch_02_0919.pdf on slides 4, 5, 6, 7, & 9.

### Comment ID 149  SC 149.3.2.3  P104  L39  #56

**Comment Type:** E  **Comment Status:** A  **Terminology**  

Redundant statement?

**SuggestedRemedy**

Change from: "... separated into a 10-bit OAM field, separated from the 64B/65B blocks, and fifty 64B/65B blocks."  
To: "... separated into a 10-bit OAM field and fifty 64B/65B blocks."

**Response**

**Response Status:** C  

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the requested change to increase reader understanding.

### Comment ID 149  SC 149.3.2.3.1  P105  L37  #67

**Comment Type:** T  **Comment Status:** D  **Proposed Response**  

Reject OOS  

The description should consider the interleaved cases.

**SuggestedRemedy**

Change from: "... from rx_PAM4_0 to rx_PAM4_1799 (see Figure 149–7)."  
To: "... from rx_PAM4_0 to rx_PAM4_1800xL-1, where L is the interleaving depth (see Figure 149–7 for the L=1 case)."

**Proposed Response**

**Response Status:** Z  

REJECT.

This comment was WITHDRAWN by the commenter.
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

P802.3ch D2.1

Comment Type T Comment Status A EZ
Although both 3.0.14 and 3.2322.14 are copies of each other, I think it is better to refer to 3.2322.14 here.

Suggested Remedy
Change "3.0.14" to "3.2322.14".

Response Response Status C
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make change to improve understanding. Other Clauses reference their specific bits instead of the generic bits even though they have the same impact.

Comment Type T Comment Status A
The RS-FEC encoder input of 3260 bits consist of tx_group50x65B AND the 10-bit OAM.

Suggested Remedy
Change line 31 from: "... takes the 3260-bit vector tx_group50x65B, and ..."
To: "... takes the 3260-bit vector tx_group50x65B and the 10-bit OAM_field, and ..."

Response Response Status C
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the following change to fix an error in the draft.
Change line 31 from: "... takes the 3260-bit vector tx_group50x65B, and ..."
To: "... takes the 3260-bit vector, consisting of tx_group50x65B and the 10-bit OAM_field, and ..."

Comment Type T Comment Status A
Figure 149-6 shows the PCS bit ordering, not Figure 149-8.

Suggested Remedy
Change "Figure 149-8" to "Figure 149-6".

Response Response Status C
ACCEPT.
The PMA Transmit electrical specifications are given in 149.5.2.

Suggested Remedy
Change "149.1.3" to "149.5.2".

Response
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Correct the link to improve readability of the draft.

The SLAVE should align its transmit frames before it starts transmission. Otherwise MASTER will need to redo frame alignments during training.

Suggested Remedy
Change this sentence from: "During startup, prior to entering the COUNTDOWN state, the SLAVE shall align …" To: "During startup, prior to entering the TRAINING state, the SLAVE shall align …"

Response
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make requested change to fix deficiency in current draft.

It is not clear what is meant by "each InfoField" since the PFC 24 and CRC16 values will be changing after each PAM2 PHY training frame.

Suggested Remedy
Change this sentence from: "Each InfoField shall be transmitted at least 256 times …" To: "InfoField shall be transmitted at least 256 times with each change to octets 7-10 to ensure detection at link partner."

Response
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the suggested change to improve clarity.

Figure 149–28—InfoField TRAINING format octets 8/9/10 should be labeled "PHY Capability Bits" as indicated in subclause 149.4.2.4.5 and Table 149-12

Suggested Remedy
Change "UsrCfgCap" to "PHY Capability Bits" in Figure 149–28

Response
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested change to remove issue which could lead to comments during SA ballot.
Field "MSG24" in Figure 149-27 not defined. Figure 149-27 not needed since it is shown in figures 149-28 and Figure 149-29 for both PMA states.

**Response**

Remove Figure 149-27 and change first sentence of paragraph on page 143 line 30 to "The 12-octet InfoField shall include the fields in 149.4.2.4.2 through 149.4.2.4.8, also shown in Figure 149–28 and Figure 149–29."

**Response Status** C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested change to remove issue which could lead to comments during SA ballot.

---

In Table 45-155b, "EEE Ability" should be "EEE ability".

**Response**

Change "EEE Ability" to "EEE ability"

**Response Status** C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make changes defined below to make draft consistent.
P39 L19 - change "Slow wake" to "Slow Wake"
P40 L20, P40 L44, & P40 L45 - change "slow wake" to "Slow Wake" throughout the document.

---

These bits are requested by the link partner via Infofield. The current text is confusing.

**Response**

Change from: "... communicated to the link partner via Infofields ...
To: "... communicated by the link partner via Infofields ...

**Response Status** C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make requested change to improve clarity.
## 2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

### Comment 149

<table>
<thead>
<tr>
<th>CI 149</th>
<th>SC 149.1.3.3</th>
<th>P78</th>
<th>L27</th>
<th>#</th>
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<td>Broadcom</td>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
</tr>
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</table>
| **Comment** | *The last part of the sentence is missing?*
| **Suggested Remedy** | Based on D2.0, change last part of sentence from: "… to be lost or" To: "… to be lost or corrupted."
| **Response** | **Response Status** | C | **Accept** |

### Comment 149

<table>
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<th>SC 149.1.3.3</th>
<th>P78</th>
<th>L33</th>
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<td>Broadcom</td>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>R</td>
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</tbody>
</table>
| **Comment** | PHY Health status is only available when the optional OAM is enabled.
| **Suggested Remedy** | Change from: "When the PHY Health status received …" To: "When the optional MultiGBASE-T1 OAM is enabled and the PHY Health status received …"
| **Response** | **Response Status** | C | **Reject** |

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

PHY Health status is only received when MultiGBASE-T1 OAM is enabled, so making this change would add redundancy. If the commenter still wants this change, he is encouraged to resubmit this comment at SA ballot.

### Comment 149

<table>
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<th>SC 149.3.2.2.3</th>
<th>P93</th>
<th>L17</th>
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<td><strong>Comment Type</strong></td>
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<td><strong>Comment Status</strong></td>
<td>A</td>
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</table>
| **Comment** | To be consistent, "TxB" should be "tx_coded" and "RxB" should be "rx_coded".
| **Suggested Remedy** | Change "The bits of a transmitted or received block are labeled TxB<31:0> and RxB<31:0> where TxB<0> and RxB<0> represent the first transmitted bit."
| **Response** | **Response Status** | C | **Accept in Principle** |

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the requested change so the text matches the Figure.
The wording of this sentence is confusing and redundant. A better specification regarding PFC counter alignment can be found in 149.4.2.4.10, page 147 line 26:

"During startup, prior to entering the COUNTDOWN state, the SLAVE shall align its transmit 65B RS-FEC frame to within +0/–4 × S (See Table 149–1 for definition of S.) partial PHY frames of the MASTER as seen at the SLAVE MDI. The SLAVE InfoField partial PHY frame Count shall match the MASTER InfoField partial PHY frame Count for the aligned frame."

SuggestedRemedy
Replace the last two sentences: "For 10GBASE-T1, 5GBASE-T1, and 2.5GBASE-T1 the SLAVE’s PFC24 are +0/–4, +0/–2, and +0/–1 partial frames respectively with respect to the MASTER’s PFC24."
To: "For the requirements on the SLAVE and the MASTER frame alignment, see 149.4.2.4.10."

Response
ACCEPT IN PRINCIPLE.
This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

The term "RS-FEC frame count" is a continous counter of the RS-FEC frames. But in Table 149-5, it is used to indicate the length of LPI signals.

SuggestedRemedy
In Table 149-5, change the top row of the second column from "RS-FEC frame count" to "Number of RS-FEC frame periods."

Response
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the suggested change to eliminate redundant specifications in the draft.

The formula may result in non-integer output for the RS-FEC frame count.

SuggestedRemedy
Change the formula to: " RS-FEC frame count = floor (PFC24 / 4) mod 96."

Response
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the suggested change to eliminate redundant specifications in the draft.

The formula may result in non-integer output for the RS-FEC frame count.

SuggestedRemedy
Change the formula to: " RS-FEC frame count = floor (PFC24 / 4) mod 96."

Response
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the suggested change to correct an error in the draft.
### 2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

<table>
<thead>
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<th>SC</th>
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<td>#</td>
</tr>
</tbody>
</table>

**Graba, Jim Broadcom**

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

The "side-stream scrambler" is in the PCS, not in the PMA.

**SuggestedRemedy**

Delete "PMA" from this sentence.

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the suggested change to correct an error in the draft.

<table>
<thead>
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<th>CI</th>
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<th>P111</th>
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<td>149</td>
<td>149.3.6.3</td>
<td>P111</td>
<td>L 9</td>
<td>#</td>
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</tbody>
</table>

**Graba, Jim Broadcom**

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

Mention of Infofield is distracting. And there aren't 128 InfoField bits.

**SuggestedRemedy**

Remove "with the exception that the Infofield consists of a sequence of 128 zeros".

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the following change to correct an error in the draft.

change "Two-level PAM refresh symbols are generated using the PMA side-stream scrambler polynomials described in 149.3.4 and exactly as is shown in Figure 149–11 with the exception that the Infofield consists of a sequence of 128 zeros. The 10-bit OAM symbol to be transmitted is XORed with the last 10 bits of the PAM2 refresh transmission. The training sequence described in 149.3.4 shall be used during the LPI mode, with the scramblers free-running from PCS Reset."

to "Two-level PAM refresh symbols are generated from the T_n mapping defined in 149.3.5.1 of S_n defined in 149.3.5, with the exception that the Infofield consists of zeros. The 10-bit OAM symbol to be transmitted is XORed with the last 10 bits of the PAM2 refresh transmission."

<table>
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<tr>
<th>CI</th>
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<th>P116</th>
<th>L</th>
<th>111</th>
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<td>149.3.7.3</td>
<td>P116</td>
<td>L 50</td>
<td>#</td>
</tr>
</tbody>
</table>

**Graba, Jim Broadcom**

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

The RFER Monitor state monitors the RS-FEC frame error ratio.

**SuggestedRemedy**

Change from: "... monitors the received signal for high Reed Solomon frame error ratio." To: "... monitors the received signal for high RS-FEC frame error ratio."

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make requested change to improve clarity.
<table>
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<th>CI</th>
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<th>P117</th>
<th>L1</th>
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<tr>
<td>&quot;65B-RS_FEC&quot; should be &quot;65B RS-FEC&quot;.</td>
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<td>Change &quot;65B-RS_FEC&quot; to &quot;65B RS-FEC&quot;.</td>
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<tr>
<td>In Figure 149-18, there are no states named &quot;RECEIVE_LPI&quot; or &quot;RECEIVE_WAKE&quot;.</td>
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<tr>
<td>1. Change &quot;RECEIVE_LPI&quot; to &quot;RX_L&quot;.</td>
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<td>2. Change &quot;RECEIVE_WAKE&quot; to &quot;RX_W&quot;.</td>
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<tr>
<td>3. Change &quot;Figure 149-18&quot; to &quot;Figure 149-19&quot;.</td>
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<td>This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.</td>
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<td>Make suggested changes to fix errors in the draft.</td>
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<tr>
<td>Figure 149-32, transition from SIGDET_WAIT to SILENT_WAIT the condition is misspelled</td>
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<td>Change send_s_sidget to send_s_sigidet</td>
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<td>Make suggested change to fix typo.</td>
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</table>
In Figure 149.7 the eight arrows from the "Input to decoder function 65B block" to the XGMII at the top of the drawing should be pointing up towards the XGMII.

Suggested Remedy
Reverse the arrows

Response
Response Status C
ACCEPT.

There are multiple amendments missing from the front matter (802.3cn, 802.3cq, and soon 802.3cm) which are now in SA ballot. 802.3cn is now Amendment four, before 802.3cg, as well.

Suggested Remedy
Insert missing amendments in correct order in front matter

Response
Response Status C
ACCEPT.

Zimmerman, George
CME Consulting/ADI, APL Gp, Aquantia, BMW, Cisco

* AUTO-NEGOTIATION IS OPTIONAL should read for 10GBASE-T1 otherwise the asterisk looks like a general comment on auto-negotiation rather than specific to the 10GBASE-T1 stack

Suggested Remedy
add "FOR 10GBASE-T1" after "AUTO-NEGOTIATION IS OPTIONAL"

Proposed Response
Response Status Z
REJECT.

This comment was WITHDRAWN by the commenter.

Zimmerman, George
CME Consulting/ADI, APL Gp, Aquantia, BMW, Cisco

"PHY Vendor specific" and "Link Partner vendor specific data" isn't a specific enough name for these registers, in the context of clause 45. These registers are specific to MultiGBASE-T1. As labeled, they look like general registers for ANY 802.3 PHY type. Suggest change name to "MultiGBASE-T1 PHY vendor specific data" and "MultiGBASE-T1 link partner PHY vendor specific data". Note also capitalization and alignment of the link partner register name

Suggested Remedy
Change as per comment. Also change names in 45.2.1.199 and table 45-155f

Response
Response Status C
ACCEPT IN PRINCIPLE.

Resolved by the response to comment 1, copied below.

In Table 45-3:
Change the name of register 1.2316 to "MultiGBASE-T1 user defined data" in subclause 45.2.1.199
Change the name of register 1.2317 to "MultiGBASE-T1 link partner user defined data" in subclause 45.2.1.200
In 45.2.1.199:
Change the title to "MultiGBASE-T1 user defined data register (Register 1.2316)"
Change the text to: "The assignment of bits for the MultiGBASE-T1 user defined data register is shown in Table 45–155f. The values of the bits in this register are outside the scope of this standard."

In Table 45-155f:
Change the title to: "MultiGBASE-T1 user defined data register bit definitions"
Change the Name to: "MultiGBASE-T1 user defined data"
Change the Description to: "16 bits of vendor specific data that the PHY sends to its link partner"
Delete the last row of the table.
Change footnote a to "R/W = Read/Write"
In 45.2.1.199.1:
Change the title to: "PHY vendor specific data (1.2316.15:0)"
Change text to: "Bits 1.2316.15:0 contain vendor specific data that the PHY may communicate to its link partner during training."
Delete 45.2.1.199.2
Create a new level 4 subclause:
"45.2.1.200 MultiGBASE-T1 link partner user defined data register (Register 1.2317)" with text:
"The assignment of bits for the MultiGBASE-T1 link partner user defined data register is shown in Table 45–155g. The values of the bits in this register are outside the scope of this standard."
Create Table 45-155g with title "MultiGBASE-T1 link partner user defined data register bit definitions" and a row with Name entry for 1.2317.15:0 is "Link partner PHY vendor specific
data", Description is "16 bits of vendor specific data that the PHY may receive from its link partner", R/W is "RO", and footnote a is "RO = Read only"
Create a new level 5 subclause:
"45.2.1.200.1 Link partner PHY vendor specific data (1.2317.15:0)" with text "Bits 1.2317.15:0 contain vendor specific data that the PHY may receive from its link partner during training."

**Table 45-9**

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P32</th>
<th>L29</th>
<th># 120</th>
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<tr>
<td>E</td>
<td>A</td>
<td>EZ</td>
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</tr>
<tr>
<td>&quot;Minimum SNR margin&quot; - Minimum should not be capitalized (it isn't the first word or an acronym)</td>
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<tr>
<td><strong>SuggestedRemedy</strong></td>
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<tr>
<td>Change Minimum to minimum.</td>
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</tbody>
</table>

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested change to follow IEEE802.3 style.

**Table 45-9**

<table>
<thead>
<tr>
<th>CI</th>
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<tr>
<td>E</td>
<td>A</td>
<td>EZ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHY names should not break across lines.</td>
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<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
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</tr>
<tr>
<td>Widen first column of Tables 45-9 and 45-10 and use non-breaking hyphens in BASE-T1 instances. (Do both - this way no matter what happens in the future, PHY names won't break across lines.)</td>
<td></td>
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<td><strong>Response Status</strong></td>
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<tr>
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</table>
Comment Type: TR
Comment ID: 123

(Comment PRECD1) The language of "Actual precoder requested" or "selected" is all messed up and confusing. Which precoder parameters relate to the local transmitter and which to the request of the link partner's transmitter is not consistent. The "Link partner" ones are all clear, leaving me to think that it is just the local PHY's REQUEST, which is meant here.

Suggested Remedy

Make the following changes:

Page 37 line 21 (Table 45-155b) change "Actual precoder requested" to "PrecodeSel".
Page 38 line 8 (45.2.1.193.5 header) change "Actual precoder selected" to "PrecodeSel", and replace text of 45.2.1.193.5 (P38 lines 10-12) to read as follows:
"Bits 1.2310.4:3 contain the requested precoder setting communicated by the PHY to the link partner via Infofields in the PrecodeSel field (see 149.4.2.4.4)."

Page 39 line 15 (Table 45-155c) and Page 38 line 45 (45.2.1.194.2 header) change "Precoder request override" to "Precoder Selection", and replace text (P38 lines 47-48) to read as follows:
"When 1.2311.5 is set as a one, the PHY shall use 1.2311.3:2 for the value of PrecodeSel, and when set to a zero the PHY controls the value of PrecodeSel. PrecodeSel is the desired precoder setting communicated to the link partner via Infofields specified in 149.4.2.4.4."

Page 39 line 23 (Table 45-155c) and Page 39 line 37 (45.2.1.194.4 header) change "Precoder requested" to "User precoder selection", and replace text (P39 lines 38-39) to read as follows:
"When bit 1.2311.5 is a one, bits 1.2311.3:2 are the requested precoder setting communicated by the PHY to the link partner via the PrecodeSel bits in the Infofield (see 149.4.2.4.4)."

Response

ACCEPT IN PRINCIPLE.

Make the following changes:

Page 37 line 21 (Table 45-155b) change "Actual precoder requested" to "PrecodeSel".
Page 38 line 8 (45.2.1.193.5 header) change "Actual precoder selected" to "PrecodeSel", and replace text of 45.2.1.193.5 (P38 lines 10-12) to read as follows:
"Bits 1.2310.4:3 contain the requested precoder setting communicated by the PHY to the link partner via the PrecodeSel bits in the Infofield (see 149.4.2.4.4)."

Page 39 line 15 (Table 45-155c) and Page 38 line 45 (45.2.1.194.2 header) change "Precoder request override" to "Precoder Selection", and replace text (P38 lines 47-48) to read as follows:
"When 1.2311.5 is set to a one, the PHY shall use 1.2311.3:2 for the value of PrecodeSel, and when set to a zero the PHY controls the value of PrecodeSel. PrecodeSel is the desired precoder setting communicated to the link partner via the Infofield specified in 149.4.2.4.4."
the changes to allow the user to set precoder selection and the reporting of the link monitor's precoder request have made these registers confusing and duplicate. They are now better delegated to just control the test mode precoder forcing, since the user can force his precoder from the remote device. For testing purposes, an override control could be put in the test mode register as well, but in no normal operation case would you want the control register to modify the precoder (either you do it by link partner request determined by the PHY or by the link partner registers forcing a configuration). Also, nowhere do we link PreciseSel to the precoder setting with a requirement (shall).

**SuggestedRemedy**

Delete row for 1.2309.10:9 from Table 45-155a (page 35 lines 40-44)

Change reserved row in Table 45-155a (page 35 line 45) from 1.2309.8:0 to 1.2309.10:0

Delete page 36 lines 40-48, subclause 149.2.1.192.4 and renumber.

On page 41 line 33, Change Reserved row to be : 1.2313.12 | Reserved | Value always 0 | RO

and insert three new rows below the new reserved row:

1.2313.11 | Local transmitter precoder override | 0 = Normal Operation
1 = User Override | R/W
1.2313.10:9 | Local transmit precoder setting | 00 = transmit with no precoder
01 = transmit with 1-D precoder
10 = transmit with 1+D precoder
11 = transmit with 1-D2 precoder | R/W
1.2313.8:2 | Reserved | Value always 0 | RO

On page 41 line 47, add new subclauses after 45.2.1.196.1 and renumber appropriately:

45.2.1.196.2 Local transmitter precoder override (1.2313.11)
When bit 1.2313.11 is set to one, the local transmitter's precoder shall be controlled by the value of bits 1.2313.10:9, and the precoder requested by the link partner in PreciseSel shall be ignored. When bit 1.2313.11 is set to zero, the transmitter shall ignore the bits 1.2313.10:9, and the precoder is set according to the value of PreciseSel received from the link partner as specified in 149.3.2.2.20. The default value of 1.2313.11 is zero.

45.2.1.196.3 Local transmit precoder setting (1.2313.10:9)
When bit 1.2313.11 is set to one, bits 1.2313.10:9 control the precoder setting of the local transmitter, as defined in 149.3.2.2.20 in the variable precoder_type. For testing purposes, the precoder can be set using these bits, and the specified test can be carried out by using these bits, bit 1.2313.11, and enabling test mode 3. During normal operation, bit 1.2313.11 is set to zero, and the precoder is set according to the value of PreciseSel received from the link partner, and bits 1.2313.10:9 are ignored.

Add PICS items MM232 and MM233(editorial license to number and position appropriately):
the link partner, and bits 1.2313.10:9 are ignored.

Add PICS items MM232 and MM233 (editorial license to number and position appropriately):

(Feature | Subclause | Value/comment | Status | Support)

When bit 1.2313.11 is set to one, the value in bits 1.2313.10:9 control the local transmitter's precoder | 45.2.1.196.2 | M | Yes [] No []

When bit 1.2313.11 is set to zero, the value in bits 1.2313.10:9 are ignored and the link partner's request controls the local transmitter's precoder | 45.2.1.196.2 | M | Yes [] No []

On page 102 line 27 (149.3.2.2.20), change "The precoder_type is determined by the PCS decoding two bits in InfoField messages received from the remote PHY during training as:* to: "In normal operation (see 45.2.1.196.3) the value of precoder_type shall be set to the value of PrecodeSel received from the link partner in the InfoField messages (see 149.4.2.4.5):"

(this PICS is already covered by PCT21)
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

P802.3ch D2.1

Zimmerman, George
CME Consulting/ADI, APL Gp, Aquantia, BMW, Cisco

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**Comment ID: 127**

**Comment Type:** TR  
**Comment Status:** A  
**Zimmerman, George**  
CME Consulting/ADI, APL Gp, Aquantia, BMW, Cisco

**SuggestedRemedy**

Insert new second sentence in first paragraph of 149.3.9 "When OAM is implemented, behavior shall conform to the state diagrams in Figure 149-24 and Figure 149-25." Add new first PICS item to 149.11.4.2.8 OAM:

State diagram behavior | 149.3.9.4 | Conforms to Figure 149-24 and 149-25 | OAM: M | Yes [ ] No [ ]

**Response**  
**Response Status:** C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested changes to clarify requirement when OAM is implemented.

---

**Comment ID: 128**

**Comment Type:** TR  
**Comment Status:** D  
**Response Status:** Z

Zimmerman, George  
CME Consulting/ADI, APL Gp, Aquantia, BMW, Cisco

**Proposed Response**

REJECT.  

This comment was WITHDRAWN by the commenter.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response Status</th>
<th>Response</th>
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<tbody>
<tr>
<td>129</td>
<td>E</td>
<td>A</td>
<td>Change cross-ref from 149.3.2.2.18 to 149.3.2.2.16</td>
<td>C</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>130</td>
<td>T</td>
<td>A</td>
<td>delete sentence fragment, or change it to read: &quot;The transition to or from LPI mode should not cause any MAC frames to be lost or corrupted.&quot;</td>
<td>C</td>
<td>ACCEPT IN PRINCIPLE.</td>
</tr>
<tr>
<td>131</td>
<td>E</td>
<td>A</td>
<td>&quot;The subsequent functions of the PCS Transmit process* is meaningless, because the preceding text no longer talks about the generation of 65B blocks.</td>
<td>C</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>132</td>
<td>E</td>
<td>A</td>
<td>Typo: RS-FE</td>
<td>C</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>133</td>
<td>E</td>
<td>A</td>
<td>Missing comma on parenthetical phrase: &quot;Each pair of bits, {A, B}, where A is the bit arriving first is converted to&quot;</td>
<td>C</td>
<td>ACCEPT IN PRINCIPLE.</td>
</tr>
</tbody>
</table>

Note: This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot. Make the requested change to improve readability.
P802.3ch D2.1  32.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

Zimmerman, George  CME Consulting/ADI, APL Gp, Aquantia, BMW, Cisco

Comment Type E  Comment Status A  EZ
typo: send_s_sidget = true

SuggestedRemedy
change send_s_sidget to send_s_sigdet

Response Response Status C
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested change to fix typo.

---

Comment Type TR  Comment Status A  PMA
The only constraint on DataSwPFC24 is that it is 24 bits and a multiple of 16. A PFC interval is 450 baud intervals, which at 10 gig is 80 nsec. As it is, this allows startup to hang for 16776960*80nsec = 1.342 seconds, which is WAY too long for a 100 msec total startup to allocate for a synchronization countdown after both receivers are reporting they are OK. A constraint of 500 (40 usec) should be more than enough, and would still be reasonable at 2.5 gig (160 usec). Also, DataSwPFC24 could be so close to the current PFC that the link partner might not be able to sync.

SuggestedRemedy
Add new final sentence to end of paragraph in 149.4.2.4.6: "DataSwPFC24 shall be a minimum of 64 and a maximum of 512 from the current PFC24 value."

Response Response Status C
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the requested change as current state transitions in our diagrams assume this precedence.

---

Comment Type E  Comment Status A  EZ
IEEE 802.3 state diagrams do not have precedence defined other than parentheses. To avoid parentheses around logical functions of relational operators (>, =, <, etc.) or combinations of AND and OR operations, adopting precedence is recommended. Fortunately, 802.3bit did this work and it is in clause 145.

SuggestedRemedy
Change "The notation used in the state diagrams follows the conventions of 21.5." to "The notation used in the state diagrams follows the conventions of state diagrams as described in 21.5, along with the extensions described in 145.2.5.2.

Response Response Status C
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested change to clarify draft.
In addition, on P125 L21 change "OAM 10-bit field" to "10-bit OAM field".

---

Comment Type E  Comment Status A  EZ
"OAM field: The OAM10-bit field" - there is no such phrase as OAM10-bit field... And defining the OAM field as the OAM field isn't useful.

SuggestedRemedy
Change "The OAM10-bit field in each PHY frame" to "A 10-bit field in each PHY frame reserved for the OAM symbol"

Response Response Status C
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested change to clarify draft.
In addition, on P125 L21 change "OAM 10-bit field" to "10-bit OAM field".

---

Comment ID 135  Page 35 of 45  9/12/2019  2:10:23 PM
TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

Zimmerman, George  
CME Consulting/ADI, APL Gp, Aquantia, BMW, Cisco

Comment Type  T  Comment Status  A  Start up

"The MultiGBASE-T1 PMA shall take no longer than 100 ms to enter the PCS_DATA state after exiting from reset or low power mode." is a non-interoperable way of stating a startup time requirement. The startup time may be allocated to one training state in one phy and another training state in another phy. To get interoperability, startup time must be allocated to phy control states.

Suggested Remedy

Task force to discuss. (this requires some consensus building - sorry!)

Response  Response Status  C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Change: The MultiGBASE-T1 PMA shall take no longer than 100 ms to enter the PCS_DATA state after exiting from reset or low power mode.

To: The MultiGBASE-T1 PMA takes no longer than 100 ms to enter the PCS_DATA state after exiting from reset or low power mode (see Figure 149-33).

And: Delete PICS item PR2 (149.11.4.3.1, page 181 line 47)

Comment Type  E  Comment Status  A  EZ

While the title for Figure 149-43 says there are 5 curves, the figure only shows 2 curves (this is due to frequency overlaps), but is confusing. Also, 2.5G no longer has the "N" factor, which makes the figure even more confusing.

Suggested Remedy

Divide Figure 149-43 into 3 figures, one for 2.5G, one for 5G and one for 10G. Alternately, delete the figure.

Response  Response Status  C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested change to help the reader.

Comment Type  E  Comment Status  A  EZ

While Fmax is used for several link segment parameters, it only gets defined for insertion loss. This definition (Equation 149-18) needs to be moved up to 149.7

Suggested Remedy

Insert new second paragraph in 149.7: "For the three different PHY types, link segment parameters are specified to different upper frequencies, given by the parameter Fmax shown in Equation 149-17."

Insert (new) Equation 149-17, which is the current Equation 149-18: Fmax = 4000 X S Followed by "See Table 149-1 for definition of S."

Delete lines 30 through 33, so that 149.7.1.1 after the equation (currently 149-17, now 149-18) reads:
f is the frequency in MHz; 1 <= f <= Fmax.
The insertion loss is illustrated in Figure 149-42.

Response  Response Status  C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make suggested change to clarify draft.
It is important to limit the noise ingress even outside the bandwidth of the PHY, especially if multiple rates of PHYs are to be used together in the same system. As such, the PSANEXT and PSAFEXT characteristic needs to be specified to the same frequency for all PHY types.

Suggested Remedy:
Replace Fmax on Page 169 line 9 and Page 170 line 6 with 4000 MHz.

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Also, delete PICS ES3 and ES4.

IEEE Std 802.3 does not specify equipment, and can't put a 'shall' on "All equipment subject to this clause...shall conform to the potential environmental stresses", or to the systems integrating the PHY (149.9.2.2). 802.3cg had similar language in ballots and the suggested language is drawn from the remedies there.

Suggested Remedy:
Change "shall conform" to "is expected to conform" in 149.9.2.1, and "shall comply" with "is expected to comply" in 149.9.2.2.

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

While automotive testing requires the use of CISPR 25, other applications may not use this. P172 L45-48 make it clear that CISPR25 is used for automotive applications.

Remove the text as suggested and remove PICS ES5 on P190 L20.
### 32.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

<table>
<thead>
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<td>146</td>
<td>45</td>
<td>E</td>
<td>41</td>
<td>51</td>
<td>E</td>
<td>A</td>
<td>“Reserved” should be ‘Link partner vendor specific data’</td>
<td>C</td>
<td>ACCEPT.</td>
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<tr>
<td>147</td>
<td>45</td>
<td>E</td>
<td>42</td>
<td>30</td>
<td>E</td>
<td>A</td>
<td>‘s_n’ should be ‘S_n’ to match usage in 149.3.4</td>
<td>C</td>
<td>ACCEPT IN PRINCIPLE.</td>
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<tr>
<td>148</td>
<td>49</td>
<td>E</td>
<td>91</td>
<td>33</td>
<td>E</td>
<td>A</td>
<td>Arrows are in wrong direction and should point toward the XGMII</td>
<td>C</td>
<td>ACCEPT IN PRINCIPLE.</td>
</tr>
</tbody>
</table>

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Correct the link to improve readability of the draft.
McClellan, Brett Marvell

**Comment Type** E  **Comment Status** A  **EZ**
149.3.2.2.3 uses the term 'descrambler' for the receiver. Should probably match it in this figure.

**Suggested Remedy**
change 'scrambler' to 'descrambler'

**Response**
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the requested change so the Figure matches the text.

---

McClellan, Brett Marvell

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

"offset by the link partner’s."  awkward language

**Suggested Remedy**
change to "offset between the link partners."

**Response**
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make requested change to improve clarity.

---

McClellan, Brett Marvell

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

"typo"

**Suggested Remedy**
change 'an' to 'a'

**Response**
ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the requested change to fix an error in the draft.
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

P802.3ch D2.1

---

**Comment**

The example values do not match the register definitions for 1.2314 and 1.2315. The examples use a resolution of 1/2560 instead of 0.1 dB.

**Suggested Remedy**

lines 5 and 13, delete the example text ", 12.7 dB represented by 0xFF00, and –12.7 dB represented by 0x0100"

**Response**

Accept in principle.

P42, L5 Change "0x8000" to "0x80"
P42, L6 Change "0xFF00" to "0xFF"
P42, L8 Change "0x0100" to "0x01"

P42 L7 Insert the following text: The assignment of bits in the MultiGBASE-T1 SNR operating margin register is shown in Table 45–155x.

Add a register bit definition table (45-155x) with the following 2 content rows:

| 1.2314.15:8 | MultiGBASE-T1 SNR operating margin | value of current SNR operating margin in dB | RO 1.2314.7:0 | Reserved | Value always 0 | RO

With the following note on the table: *aRO = Read only

P42, L13 Change "0x8000" to "0x80"
P42, L13 Change "0xFF00" to "0xFF"
P42, L13 Change "0x0100" to "0x01"

P42 L15 Insert the following text: The assignment of bits in the MultiGBASE-T1 Minimum SNR margin register is shown in Table 45–155y.

Add a register bit definition table (45-155y) with the following 2 content rows:

| 1.2315.15:8 | MultiGBASE-T1 Minimum SNR margin | value of minimum observed SNR margin in dB | RO 1.2315.7:0 | Reserved | Value always 0 | RO

With the following note on the table: *aRO = Read only

---

**Comment**

"The 3600 bits in this frame are then encoded into 1800 PAM4 symbols and transferred sequentially to the PMA."

This statement is incorrect. Following the RS-FEC interleaving, there is no longer a 3600 bit frame for L=2 or 4.

Further, the bits are scrambled prior to PAM4 mapping.

**Suggested Remedy**

Delete this sentence.

**Response**

Accept.

---

**Comment**

Per Figure 78-1 and 46.4 it is not the MAC but the RS and LPI Client that controls entry to LPI mode.

**Suggested Remedy**

Change 'MAC' to 'RS'

**Response**

Accept in principle.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the requested change to fix an error in the draft.
## 32.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

**Comment ID** 149  **Comment Status** A  **Comment Type** T  **Response Status** C  **EZ**

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<td><strong>SuggestedRemedy</strong></td>
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<tr>
<td>There's no signals defined as TXD&lt;32&gt; to TXD&lt;63&gt;. Only the XGMII TXD&lt;0&gt; to TXD&lt;31&gt;.</td>
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<td>ACCEPT IN PRINCIPLE.</td>
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<td>This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.</td>
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<tr>
<td>Make change as requested as the current implementation could cause additional comments in the future.</td>
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**Comment ID** 149  **Comment Status** A  **Comment Type** T  **Response Status** C  **EZ**

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<tr>
<td>There's no signals defined as RXD&lt;32&gt; to RXD&lt;63&gt;. Only the XGMII RXD&lt;0&gt; to RXD&lt;31&gt;.</td>
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**Comment ID** 108  **Comment Status** D  **Comment Type** T  **Response Status** C  **EZ**

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<tr>
<td><strong>SuggestedRemedy</strong></td>
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<tr>
<td>&quot;The transmit function of the PHY initiates a transition to the LPI transmit mode when it generates 8 RS-FEC frames composed entirely of LPI control characters, as described in 149.3.2.2.22. The transmit function of the link partner signals the transition using the sleep signal&quot; awkward language and why reference the link partner? This text is about the local device and LPI signaling.</td>
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<td>Make change as requested to increase reader understanding.</td>
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**Comment ID** 149  **Comment Status** A  **Comment Type** T  **Response Status** C  **EZ**

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</tbody>
</table>
2.1 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Autom

McClellan, Brett Marvell

The prior paragraphs talk about the transmitter and signaling, suddenly this paragraph changed topic to receiver behavior.

**Suggested Remedy**

Change text to

"The end of LPI mode occurs at the transmission of the alert signal indicating the end of quiet-refresh cycle."

also move this orphaned text prior to figure 149-14

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the requested change to increase reader understanding.

The editor will try to move the text.

---

**Comment ID** 163

**McClellan, Brett Marvell**
There are several problems with this paragraph. Twice it references 149.3.4 however the Infofield and the training sequence are not specified in 149.3.4. It also fails to refer to the appropriate PAM2 mapping.

SuggestedRemedy
change "Two-level PAM refresh symbols are generated using the PMA side-stream scrambler polynomials described in 149.3.4 and exactly as is shown in Figure 149–11 with the exception that the Infofield consists of a sequence of 128 zeros. The 10-bit OAM symbol to be transmitted is XORed with the last 10 bits of the PAM2 refresh transmission. The training sequence described in 149.3.4 shall be used during the LPI mode, with the scramblers free-running from PCS Reset." to "Two-level PAM refresh symbols are generated from the T_n mapping defined in 149.3.5.1 of S_n defined in 149.3.5 with the exception that the Infofield consists of zeros. The 10-bit OAM symbol to be transmitted is XORed with the last 10 bits of the PAM2 refresh transmission."

Response

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Make the following change to correct an error in the draft.

change "Two-level PAM refresh symbols are generated using the PMA side-stream scrambler polynomials described in 149.3.4 and exactly as is shown in Figure 149–11 with the exception that the Infofield consists of a sequence of 128 zeros. The 10-bit OAM symbol to be transmitted is XORed with the last 10 bits of the PAM2 refresh transmission. The training sequence described in 149.3.4 shall be used during the LPI mode, with the scramblers free-running from PCS Reset." to "Two-level PAM refresh symbols are generated from the T_n mapping defined in 149.3.5.1 of S_n defined in 149.3.5, with the exception that the Infofield consists of zeros. The 10-bit OAM symbol to be transmitted is XORed with the last 10 bits of the PAM2 refresh transmission."
The values of the bits in these registers are all zeros unless the PHY identifies the link partner during Auto-Negotiation through communicating OUIs using the NEXT pages. Identification of the link partner is not defined and is beyond the scope of this specification. I suggest borrowing the text from Clause 55.

**Suggested Remedy**

change text to "If during Auto-Negotiation both devices agree on the use of the vendor specific messages, they may be used as a communication channel; otherwise the bits are set to zero."

**Response**

Resolved by the response to comment 1, copied below.

In Table 45-3:
- Change the name of register 1.2316 to "MultiGBASE-T1 user defined data" in subclause 45.2.1.199.
- Change the name of register 1.2317 to "MultiGBASE-T1 link partner user defined data" in subclause 45.2.1.200.

In 45.2.1.199:
- Change the title to "MultiGBASE-T1 user defined data register (Register 1.2316)"
- Change the text to: "The assignment of bits for the MultiGBASE-T1 user defined data register is shown in Table 45–155f. The values of the bits in this register are outside the scope of this standard."

In Table 45-155f:
- Change the title to: "MultiGBASE-T1 user defined data register bit definitions"
- Change the Name to: "MultiGBASE-T1 user defined data"
- Change the Description to: "16 bits of vendor specific data that the PHY sends to its link partner"
- Delete the last row of the table.
- Change footnote a to "R/W = Read/Write"

In 45.2.1.199.1:
- Change the title to: "PHY vendor specific data (1.2316.15:0)"
- Change the text to: "Bits 1.2316.15:0 contain vendor specific data that the PHY may communicate to its link partner during training."
- Delete 45.2.1.199.2
- Create a new level 4 subclause: "45.2.1.200 MultiGBASE-T1 link partner user defined data register (Register 1.2317)" with text:
  "The assignment of bits for the MultiGBASE-T1 link partner user defined data register is shown in Table 45–155g. The values of the bits in this register are outside the scope of this standard."
- Create Table 45-155g with title "MultiGBASE-T1 link partner user defined data register bit definitions" and a row with Name entry for 1.2317.15:0 is "Link partner PHY vendor specific data". Description is "16 bits of vendor specific data that the PHY may receive from its link partner. R/W is "RO", and footnote a is "RO = Read only".
- Create a new level 5 subclause: "45.2.1.200.1 Link partner PHY vendor specific data (1.2317.15:0)" with text "Bits 1.2317.15:0 contain vendor specific data that the PHY may receive from its link partner during training."

**Comment ID**: 168
To ensure interoperability during the training phase, certain timing allocations between Master, Slave and other steps of training must be observed. We propose to the text of 802.3bz for interoperability and just scale the timing of 10G mode and deduct the timing for PCS_TEST that is set by min_wait_timer.

Suggested Remedy

- Modify Figure 149.33 as attached and include the associated Table 145.15 in section 149.4.2.4.10 page 147, line 35 to read as follows:

<table>
<thead>
<tr>
<th></th>
<th>MASTER</th>
<th>SLAVE</th>
<th>MAX REQUIRED TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training Silent</td>
<td>40.00</td>
<td>57.02</td>
<td>98.00</td>
</tr>
<tr>
<td>PCS Test</td>
<td>0.98</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>98.00</td>
<td>98.00</td>
<td></td>
</tr>
</tbody>
</table>

This comment does not apply to the substantive changes between IEEE P802.3ch D2.0 and D2.1 or the unsatisfied negative comments from earlier ballots. Hence it is not within the scope of the recirculation ballot.

Implement the changes defined on slide 5 of zimmerman_3ch_01b_0919.pdf, with editorial license to conform to IEEE 802.3 style.

Editorial license to add necessary PICS.

This comment is "OOS"; however, the change should be made to make the draft consistent. InfoField is the name for the set of bytes used to indicate the PHY capability; however, the capitalization is not consistent in the draft.

Suggested Remedy

- Make the following changes:
  - P38 L42, P39 L50, and P147 L31 - Change: Infofields To: the InfoField
  - P78 L29, P91 L31, and P144 L11 - Change: Infofield To: InfoField
  - P177 L16 - Change: infofield To: InfoField

In 1.4.289 add statement to the effect that Clause 149 uses a 12 octet InfoField

Change all instances of "infofield" with any capitalization to be "Infofield" throughout the P802.3ch draft.