Cl **00** *SC* **0** *P* **142** *L* **31** # 208

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *(B1) (L)*

State diagrams are generally referenced using their title followed by the figure number in parentheses, such as "the training control state diagram (Figure 178B-10)" (in 178B.7.8). However, it is inconsistent across the draft - often the figure title is missing, and sometimes "see" is included in the parentheses too.
Omitting the state diagram name is not reader-friendly, especially with external links, and "see" is redundant.

SuggestedRemedy

Make all references to state diagrams have the format "<title> (<figure cross-reference>)", without "see". Any further detials (such as a specific state) should follow the parentheses.

I originally found this issue in 178B so I listed in detail the places where corrections should be made (subclauses and the cross-reference they include):
178B.4: Figure 178B-10
178B.6: Figure 178B-9
178B.7: Figure 178B-10, Figure 178B-11, Figure 178B-12
178B.7.2: Figure 178B-10, Figure 178B-11, Figure 178B-12
178B.7.3.3: Figure 178B-10
178B.7.6: Figure 178B-11
178B.8.2.1: Figure 178B-9
178B.8.2.3: Figure 178B-9
178B.8.3: Figure 178B-10, Figure 178B-12
178B.8.3.1: Figure 178B-10, Figure 178B-11, Figure 178B-12
178B.8.3.3: Figure 178B-10
178B.8.3.4: Figure 178B-10
178B.9: Figure 178B-9

Other instances are in 73.4.3, 119.2.4.1.1, 119.2.5.8.1, 175.2.6.2, 175.2.6.2.2, 175.2.6.3, 176.4.2.2, 176.4.3.2.1, 176.4.3.2.2, 176.4.3.2.3, 176.4.4.2, 176.4.4.2.1, 177.5.2, 177.5.3, 177.7.2.1, 184.5.4, 184.7.2.2, 185.6.1, 186.2.4.7, 186.4.2.1. (I only looked for the string "state diagram"; please check for bare references to the corresponding figures in addition).

Implement with editorial license across the draft where applicable.

[CC 178B, 73, 119, 175, 176, 177, 184, 185, 186]

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

For some of the references called out in the suggested remedy it may not make sense to implement the proposed change based on the context of the surrounding text, but for other cases (especially those related to state variable definitions) the proposed change would improve the consistency of such references across the draft.

Implement the suggested remedy at the discretion of the clause editor and with editorial license.

[Editor's note: CC: 178B, 73, 119, 175, 176, 177, 184, 185, 186]

Cl **73** *SC* **73.10.2** *P* **155** *L* **16** # 1

Lusted, Kent — Synopsys

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

The current value of "link_fail_inhibit_timer" for the 200G/lane PHYs is currently much less than the value of the "max_wait_timer" in Annex 178B.8.3.3. (Per D2.2, the max_wait_timer_duration is 30 seconds in Clause 178.8.9 and 179.8.9).

Additionally, the value of max_wait_timer_duration can be adjusted by MDIO register value and therefore the AN73 timer should have a similar control.

SuggestedRemedy

Update the value of link_fail_inhibit_timer for 200 Gbps/lane PHYs in the table 73-7 to be 30.3 (min) and 30.4 (max)

Add a new MDIO register "AN link_fail_inhibit_timer" 16b MDIO register (R/W) that sets the maximum duration of link_fail_inhibit_timer for 200 Gbps/lane CR and KR PHYs. When the timer is set to 0, the timer duration is infinite.

Presentation to be provided.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **73A** *SC* **73A.1a** *P* **722** *L* **17** # 420

Shrikhande, Kapil — Marvell Technologies

Comment Type **T** *Comment Status* **R** *(B1) (L)*

Extended FEC ability is part of the Message code 2 encoding -- bits EF0 through EF3. However, there isn't a specific use of extended FEC ability for any PHY in 802.3dj. Why reserve 4 bits for extended FEC ability when we do not have any application for this ?

SuggestedRemedy

It seems better to just call bits EF0-EF3 "Reserved" and let future projects define how to use them. Change EFO-EF3 in Table 73A-1a from "Reserved for extended FEC ability" to "Reserved".

Response *Response Status* **C**

REJECT.
The adopted baseline proposal explicitly states that a new "Message Next Page" was to be defined with bits reserved for future FEC negotiation (see: https://www.ieee802.org/3/dj/public/24_01/lusted_3dj_04_2401.pdf).

Insufficient justification has been given for making the suggested change.

Cl **73A** *SC* **73A.1a** *P* **722** *L* **22** # 54

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

The note in section 179.9 says: "A PMD can comply with one or more host classes". It is not clear then what should such an interface report

SuggestedRemedy

Add text: "If the interface complies with more than one host class it shall report the class with the minimum loss"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change table heading in Table 73A-1b from "Technology" to "Host class".

In the paragraph above Table 73A-1b, change:
"See Table 73A-1b for more details of the CR Host Class bit definitions, and 179A.4 for information regarding host channel insertion loss."
to:
"Table 73A-1b defines how EH0 and EH1 indicate CR host class. When the host class of the PHY is set to a value other than 0 0, the PMD shall be compliant to that host class. If the PMD is compliant to more than one host class, the recommended priority of which host class to indicate would be HL followed by HN. So for example, HL would be advertised if the PMD supports all three host classes. See 179.9 for host class compliance requirements."

Remove unnecessary capitilization of "host class" in Annex 73A

Implement with editorial licence.

Cl **116** *SC* **116.1.2** *P* **160** *L* **6** # 401

Swenson, Norman Nokia, Point2

Comment Type **TR** *Comment Status* **R** *(B1) (CG)*

Figure 116-1 shows only a single PMA sublayer in the architectural diagram with the PCS above and the PMD below. There is no indication that multiple PMA sublayers (interconnected by AUI-n channels) can exist between the PCS and the PMD.

SuggestedRemedy

Add a note to Figure 116-1 as follows: "Note: The single PMA sublayer shown can optionally be realized as several layered PMA sublayers, as illustrated in Annex 120A or Annex 176B.

Response *Response Status* **W**

REJECT.
Note comments #401, #402, and #404 point out the same concern in different clauses.
The comment is referring to Figure 116-1, which is in the published base standard IEEE 802.3-2022 on page 4798.
As noted in the referencing text and the title, this figure illustrates the relationship of the 200GBASE and 400GBASE PHY types relative to the OSI layered model. It is not intended to provide extensive architectural variants that are permitted for the various PHY types. There are many other details missing here that vary between PHY types, such inclusion of the xMII Extender, xAUI-n within the PHY, 800GAUI-LR1 FEC sublayer, etc. Instead, the detailed information requested in the comment is provided in each PMD clause.

Cl **116** *SC* **116.2.2** *P* **169** *L* **24** # 347

Slavick, Jeff Broadcom

Comment Type **T** *Comment Status* **A** *legacy 100 ppm (L)*

Add note to the description of the XS that is can be used for ppm domain adjustments.

SuggestedRemedy

NOTE - The Clause 176 PMA specifies 50ppm clock accuracy while Clause 120 PMA specifies 100ppm for some rates and situations. A 200/400GMII Extender with clock rate compensation may be used to adapt between the different ppm domains.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The comment is referring to 116.2.2, which is in the base standard IEEE 802.3-2022 on page 4802.

Resolve using the response to comment #165.

Cl **119** *SC* **119.1.4** *P* **187** *L* **13** # 86

Xu, Li
Huawei Technologies.

Comment Type **E** *Comment Status* **R** *(B1) (L)*

When describing the nominal rate of PMA at each lane, the 26.5625 Gtransfer/s is so strange and not aligned with that in PMA.

SuggestedRemedy

to aligh the description with PMA, 26.5625 Gtransfer/s should be changed to 26.5625 GBd

Response *Response Status* **C**

REJECT.
The text referred to in the comment is text that is not being added or modified by the 802.3dj project and is therefore out of scope. The text referred to in the comment is only included as part of the editing instruction to put the text that is being added/modifed by 802.3dj (i.e. text that is underlined or strikethrough) into context.

Cl **119** *SC* **119.1.4** *P* **187** *L* **14** # 87

Xu, Li
Huawei Technologies.

Comment Type **T** *Comment Status* **R** *(B1) (L)*

The MAC data rate of 200 Gb/s is the speed, not the capacity.

SuggestedRemedy

delete "capacity for", like "which provides capacity for the MAC data rate of 200 Gb/s--> which provides the MAC data rate of 200 Gb/s "

Response *Response Status* **C**

REJECT.
The text referred to in the comment, is text that is not being added or modified by the 802.3dj project and is therefore out of scope. The text referred to in the comment is only included as part of the editing instruction to put the text that is being added/modifed by 802.3dj (i.e. text that is underlined or strikethrough) into context.

Cl **119** *SC* **119.1.4** *P* **199** *L* **39** # 326

Slavick, Jeff
Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

We have both IS_SIGNAL.request and IS_SIGNAL.indication, both are not present in a 200/400GAUI-n

SuggestedRemedy

Change
"inst:IS_SIGNAL.indication which is carried outside"

To:
"inst:IS_SIGNAL.indication and inst.IS_SIGNAL.request which are carried outside"

In two places in item b)

Response *Response Status* **W**

ACCEPT.

Cl **119** *SC* **119.1.4** *P* **200** *L* **13** # 327

Slavick, Jeff
Broadcom

Comment Type **TR** *Comment Status* **A** *legacy 100 ppm (L)*

If there is a 200Gbps link then all links, regardless of their proximity to the PCS, need to be at 50ppm or hidden within an XS with rate compensation.

SuggestedRemedy

Remove "that is in the same package as the PCS" from item 7) and item 9)

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve with the response to comment #165.

Cl **119** *SC* **119.1.4.2** *P* **188** *L* **35** # 88

Xu, Li — Huawei Technologies.

Comment Type **T** *Comment Status* **A** *(B1) (L)*

PMA:IS_UNITDATA_i.indication is one of the PMA service interface primitives, not data streams. So the sentence is technically not correct.

SuggestedRemedy

change 'as' to 'using' and the sentence is " In the receive direction, the PCS receives n parallel streams of data using PMA:IS_UNITDATA_i.indication " primitive

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
For consistency with the existing wording in 119.2.1, using "via" instead of "as" would be an improvement to the draft.

Change the first sentence of the second paragrpah of 119.1.4.2
From:
"In the receive direction, the PCS receives n parallel streams of data as PMA:IS_UNITDATA_i.indication and signal status information using the PMA:IS_SIGNAL primitive."
To:
"In the receive direction, the PCS receives n parallel streams of data via the PMA:IS_UNITDATA_i.indication primitive and signal status information via the PMA:IS_SIGNALindication primitive."

Implement with editorial license.

Cl **119** *SC* **119.1.4.2** *P* **188** *L* **39** # 89

Xu, Li — Huawei Technologies.

Comment Type **T** *Comment Status* **A** *(B1) (L)*

same as the above line

SuggestedRemedy

same as the above line

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Assume that the comment and suggested remedy are referring to comment #88, and making the same point related to the use of the word "as", but this time for the first sentence in the third paragraph of 119.1.4.2. For consistency with the existing wording in 119.2.1, using "via" instead of "as" would be an improvement to the draft.

Change the first sentence of the third paragraph of 119.1.4.2
From:
"In the transmit direction, the PCS transmits n parallel streams of data as PMA:IS_UNITDATA_i.request and provides signal status information using the PMA:IS_SIGNAL.request primitive."
To:
"In the transmit direction, the PCS transmits n parallel streams of data via the PMA:IS_UNITDATA_i.request primitive and provides signal status information via the PMA:IS_SIGNAL.request primitive."

Implement with editorial license.

Cl **119** *SC* **119.2.4.1** *P* **191** *L* **20** # 90

Xu, Li — Huawei Technologies.

Comment Type **T** *Comment Status* **R** *(B1) (L)*

The descriptioin of the contents of each 66-bit block are not aligned in different clauses,with some mentioning transcoder and some not.
To align the descriptions in 175.2.4.1 and 172.2.4.1, mentioning of transcoder should be deleted.

SuggestedRemedy

Delete the transcoder, and modify the sentence as that in 172.2.4.1, as below:
"The contents of each 66-bit block are
contained in a vector tx_coded<65:0> with tx_coded<1:0> containing the sync header and the remainder of the bits the payload."

Response *Response Status* **C**

REJECT.
While the comment does have merit, the text being referenced is text that is not being added or modified by the 802.3dj project and is therefore out of scope. The text referred to in the comment is only included as part of the editing instruction to put the text that is a being added/modifed by 802.3dj (i.e. text that is underlined or strikethrough) into context.

Cl **119** *SC* **119.2.5.3** *P* **191** *L* **51** # 91

Xu, Li — Huawei Technologies.

Comment Type **E** *Comment Status* **R** *(B1) (L)*

Technically speaking, using created to describe 64B/66B blocks from FEC codeword is not accurate.

SuggestedRemedy

change created to decoded, and the sentence is "This may be achieved by setting the synchronization header to 11 for all 66-bit blocks decoded from these codewords by the
256B/257B to 64B/66B transcoder. "

Response *Response Status* **C**

REJECT.
While the comment does have merit, the text being referenced is text that is not being added or modified by the 802.3dj project and is therefore out of scope. The text referred to in the comment is only included as part of the editing instruction to put the text that is a being added/modifed by 802.3dj (i.e. text that is underlined or strikethrough) into context.

Cl **119** *SC* **119.2.5.3** *P* **191** *L* **51** # 92

Xu, Li — Huawei Technologies.

Comment Type **E** *Comment Status* **A** *(B1) (L)*

In the sentence, 'then' is not necessary.

SuggestedRemedy

delete 'then'

Response *Response Status* **C**

ACCEPT.

Cl **119** *SC* **119.2.5.3** *P* **191** *L* **53** # 392

Opsasnick, Eugene — Broadcom

Comment Type **TR** *Comment Status* **A** *stateless decoder (L)*

There are newly added instructions to set the first 4 66-bits blocks following an uncorrectable codeword to an error block due to scrambler error extension. However, if the next 4 blocks are part of an Alignment Marker, the affected 4 blocks from the scrambler error extension are the 4 blocks after the AMs since the AMs are removed before descrambling.

SuggestedRemedy

Update the wording either in 119.2.5.3 or in the descrambler subclause 119.2.5.6 to explain the need to mark the 4 blocks after an AM as an error block.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #32.

Cl **119** *SC* **119.2.5.3** *P* **191** *L* **53** # 32

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **A** *stateless decoder (L)*

It is not obviuos how to handle uncorrectable FEC error detected in the FEC block previous to the one carrying the AMs

SuggestedRemedy

Add text that clarifies what happens in the case noted in the comment:
"In case of an uncorrectable error detected in the codeword preceding a codeword carrying the AMs the marked 66-bit blocks are the first ones after the AMs are removed. "

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

The CRG reviewed slides #3-8 of the editorial presentation at:
https://www.ieee802.org/3/dj/public/25_11/opsasnick_3dj_01a_2511.pdf

Update 119.2.5.3 as described on slide #8 of opsasnick_3dj_01a_2511.pdf

Implement with editorial license.

Cl **119** *SC* **119.2.5.3** *P* **192** *L* **1** # 93

Xu, Li — Huawei Technologies.

Comment Type **T** *Comment Status* **A** *stateless decoder (L)*

the number of 66-bit blocks and error block are not equal.

SuggestedRemedy

change 'an error block' to 'error blocks' , and the sentence is "
the first four 66-bit blocks from the next two associated codewords processed by the Reed-Solomon decoder shall also be set to error blocks to account for the possible error propagation by the descrambler. "

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #32.

Cl **119** *SC* **119.2.5.8** *P* **192** *L* **13** # 94

Xu, Li — Huawei Technologies.

Comment Type **E** *Comment Status* **R** *(B1) (L)*

when describing rate adaptation at the transmit PCS, LPI control character is also mentioned. But at the receive PCS, there is no LPI mentioned for rate adaptation. For insertion and deletion rules, 119.2.3.5 and 119.2.3.8, and 82.2.3.6 and 82.2.3.9 are referenced seperately.

SuggestedRemedy

The description and reference of rate adaptation at the two directions should be aligned, including LPI and reference for specific insertion and deletion rules.

Response *Response Status* **C**

REJECT.
The text referred to in the comment is text that is not being added or modified by the 802.3dj project and is therefore out of scope. The text referred to in the comment is only included as part of the editing instruction to put the text that is a being added/modifed by 802.3dj (i.e. text that is underlined or strikethrough) into context.

Cl **120** *SC* **120.1.4** *P* **200** *L* **14** # 170

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *legacy 100 ppm (L)*

The wording here is very strange. The 200GMII extender is not part of the PHY. Saying " Alternatively" and "shall be implemented within an extender" isn't appropriate.

SuggestedRemedy

Replace the second sentence with an additional bullet. "For a Physical Layer that includes a 200GAUI-1 interface or a 200GBASE-KR1, 200GBASE-CR1, 200GBASE-DR1, or 200GBASE-DR1-2 PMD, and a 200GAUI-8, 200GAUI-4, or 200GAUI-2 PMA output that is only limited to ±100ppm the 200GAUI-8, 200GAUI-4, or 200GAUI-2 PMA shall be implemented within a 200GMII Extender (see Clause118) with rate matching (see 119.2.4.1). Do the same for the 400G bullet.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve with the response to comment #165.

Cl **169** *SC* **169.1.2** *P* **201** *L* **6** # 402

Swenson, Norman — Nokia, Point2

Comment Type **TR** *Comment Status* **R** *(B1) (CG)*

Figure 169-1 shows only a single PMA sublayer in the architectural diagram with the PCS above and the PMD below. There is no indication that multiple PMA sublayers (interconnected by AUI-n channels) can exist between the PCS and the PMD.

SuggestedRemedy

Add a note to Figure 169-1 as follows: "Note: The single PMA sublayer shown can optionally be realized as several layered PMA sublayers, as illustrated in Annex 120F, Annex120G, or Annex 176B.

Response *Response Status* **W**

REJECT.
Note comments #401, #402, and #404 point out the same concern in different clauses.
The comment is referring to Figure 169-1, which is in the published amendment IEEE Std 802.3-2022 on page 162.
As noted in the referencing text and the title, this figure illustrates the relationship of the 200GBASE and 400GBASE PHY types relative to the OSI layered model. It is not intended to provide extensive architectural variants that are permitted for the various PHY types. There are many other details missing here that vary between PHY types, such inclusion of the xMII Extender, xAUI-n within the PHY, Inner FEC, etc. Instead, the detailed information requested in the comment is provided in each PMD clause.

Cl **169** *SC* **169.2.4b** *P* **206** *L* **7** # 241

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **E** *Comment Status* **R** *(B1) (CG)*

While the title is singular "FEC sublayer", the actual ext address multiple FEC sublayers

SuggestedRemedy

Change title from "FEC sublayer" to "FEC sublayers"

Response *Response Status* **C**

REJECT.
The subclauses 179.2.x are describing nomeclature in general terms. Each of these other subclauses describes a class of sublayer some of which list several types are listed. For instance, "169.2.4a Attachment Unit Interface (800GAUI-n)" lists four types of 800GAUI-n, 169.2.4 Physical Medium Attachment (PMA) sublayer lists three types of PMA. The title is consistent with the intent and with other similar subclauses.

Cl **169** *SC* **169.3.2** *P* **207** *L* **24** # 403

Swenson, Norman — Nokia, Point2

Comment Type **TR** *Comment Status* **A** *(B1) (CG)*

The PMA service interface can service a PMA sublayer above, but that is not indicated in the definition of PMA service interface. This is inconsistent with the wording in 116.3.2 for 200Gbps and 400Gbps networks.

SuggestedRemedy

Change
"PMA: for primitives issued on the interface between the PMA and the PCS or DTE 800GXS above called the PMA service interface"
to
"PMA: for primitives issued on the interface between the PMA and the PCS, DTE 800GXS, or PMA above called the PMA service interface"

Response *Response Status* **W**

ACCEPT.

Cl **172** *SC* **172.1.5.2** *P* **257** *L* **19** # 95

Xu, Li — Huawei Technologies.

Comment Type **T** *Comment Status* **A** *(B1) (L)*

inst:IS_UNITDATA_0:31.indication is a primitive, not data stream. The accuracy of the description very similar to the comments above should be improved.

SuggestedRemedy

change 'as' to 'using' and the sentence is " In the receive direction, the PCS receives 32 parallel streams of data using inst:IS_UNITDATA_0:31.indication primitive and signal status information using the inst:IS_SIGNAL primitive. "

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
For consistency with the existing wording in 172.2.1, using "via" instead of "as" would be an improvement. It makes sense to also update the equivalent text in 175.1.4.2 for consistency within the draft.

In 172.1.5.2 change the sentence on page 257 at line 19
From:
"In the receive direction, the PCS receives 32 parallel streams of data as inst:IS_UNITDATA_0:31.indication and signal status information using the inst:IS_SIGNAL primitive."
To:
"In the receive direction, the PCS receives 32 parallel streams of data via the inst:IS_UNITDATA_0:31.indication primitive and signal status information via the inst:IS_SIGNAL.indication primitive."

In 175.1.4.2 change the sentence on page 284 at line 30
From:
"In the receive direction, the PCS receives 16 parallel streams of data as inst:IS_UNITDATA_0:15.indication and signal status information using the inst:IS_SIGNAL primitive."
To:
"In the receive direction, the PCS receives 16 parallel streams of data via the inst:IS_UNITDATA_0:15.indication primitive and signal status information via tthe inst:IS_SIGNAL.indication primitive."

Implement with editorial license.

[Editor's note: CC: 175]

Cl **172** *SC* **172.1.5.2** *P* **257** *L* **22** # 96

Xu, Li — Huawei Technologies.

Comment Type **T** *Comment Status* **A** *(B1) (L)*

same as the above line, the inst:IS_UNITDATA_0:31.request is a primitive, not data stream. The suggested change is the same as above.

SuggestedRemedy

same as the above line

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
For consistency with the existing wording in 172.2.1, using "via" instead of "as" would be an improvement. It makes sense to also update the equivalent text in 175.1.4.2 for consistency within the draft.

In 172.1.5.2 change the sentence on page 257 and line 22
From:
"In the transmit direction, the PCS transmits 32 parallel streams of data as inst:IS_UNITDATA_0:31.request and provides signal status information using the inst:IS_SIGNAL.request primitive."
To:
"In the transmit direction, the PCS transmits 32 parallel streams of data via the inst:IS_UNITDATA_0:31.request primitive and provides signal status information via the inst:IS_SIGNAL.request primitive."

In 175.1.4.2 change the sentence on page 284 and line 33
From:
"In the transmit direction, the PCS transmits 16 parallel streams of data as inst:IS_UNITDATA_0:15.request and provides signal status information using the inst:IS_SIGNAL.request primitive."
To:
"In the transmit direction, the PCS transmits 16 parallel streams of data via the inst:IS_UNITDATA_0:15.request primitive and provides signal status information via the inst:IS_SIGNAL.request primitive."

Implement with editorial license.

[Editor's note: CC: 175]

Cl **172** *SC* **172.2.5.9** *P* **261** *L* **51** # 97

Xu, Li — Huawei Technologies.

Comment Type **E** *Comment Status* **A** *(B1) (L)*

a comma is missed in the sentence.

SuggestedRemedy

add a comma, and the sentence is "If using a stateless method, the stateless decoder defined in
119.2.5.8.2 should be used while the stateless decoder defined in 172.2.5.9.2 may be used."

Response *Response Status* **C**

ACCEPT.

Cl **172** *SC* **172.2.5.9** *P* **261** *L* **52** # 346

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **R** *(B1) (L)*

The new sentence states to use the stateless decoder from 119 over using the 172 version. But there is also the error marking that should be done too, but we only point them towards the decoder. Indicate to th reader that if they choose to use the 119 decoder to also do the error marking too! Follow up to unsatisifed comment #459 from D2.1.

SuggestedRemedy

Insert the following after 119.2.5.8 ", including the additional error marking specified in 119.2.5.3,"

Response *Response Status* **W**

REJECT.

If the stateless decoder from 119.2.5.8.2 is being used, then the additional error marking must also be done as specified in 119.2.5.3. The requirements of 119.2.5.3 are already included in 172.2.5.3 by reference.

Cl **174** *SC* **174.1.2** *P* **268** *L* **34** # 404

Swenson, Norman — Nokia, Point2

Comment Type **TR** *Comment Status* **R** *(B1) (CG)*

Figure 174-1 shows only a single PMA sublayer in the architectural diagram with the PCS above and the PMD below. There is no indication that multiple PMA sublayers (interconnected by AUI-n channels) can exist between the PCS and the PMD.

SuggestedRemedy

Add a note to Figure 174-1 as follows: "Note: The single PMA sublayer shown can optionally be realized as several layered PMA sublayers, as illustrated in Annex 120F, Annex120G, or Annex 176B.

Response *Response Status* **W**

REJECT.
Note comments #401, #402, and #404 point out the same concern in different clauses. As noted in the referencing text and the title, this figure illustrates the relationship of the 1.6TBASE PHY types relative to the OSI layered model. It is not intended to provide extensive architectural variants that are permitted for the various PHY types.There are many other details missing here that vary between PHY types, such inclusion of the xMII Extender, xAUI-n within the PHY, Inner FEC, etc. The detailed information requested in the comment is provided in each PMD clause.

Cl **174** *SC* **174.1.4** *P* **270** *L* **5** # 239

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **E** *Comment Status* **A** *(B1) (CG)*

Prior ethernet speeds have always introduced the electrical PHY type correlation before the optics. THis clause does the reverse for no clear reason.

SuggestedRemedy

Reverse positions of Table 174-2 and 174-3.
Change references to tables as appropriate.

Response *Response Status* **C**

ACCEPT.

Cl **174A** *SC* **174A.9** *P* **744** *L* **45** # 18

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *lock error ratio acronym (CK)*

The block error ratio parameter is being used a lot in the industry now with various acronyms emerging. Should create a acronym to line everybody up. The letter "B" is taken already for "bit error ratio". The letter "K" has been used for black in color definitions (e.g., CYMK) and would be equally relevant here for "block".

SuggestedRemedy

Introduce a new acronym for block error ratio: "KER". Add new acronym to 1.5 "Abbreviations".

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

A straw poll taken at the October 30 ad hoc meeting indicated a preference for BLER as the acronym.
https://www.ieee802.org/3/dj/public/adhoc/electrical/25_1030/3dj_adhoc_straw_polls_251030.pdf

Adopt the acronym BLER for block error ratio.
Implement throughout draft where block error ratio is mentioned.
Add new acronym to 1.5 "Abbreviations".
Implement with editorial license.

Cl **174A** *SC* **174A.9.5** *P* **747** *L* **32** # 349

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CK)*

To be consistent with 178B use the order of AUI component or PMD instead of PMD or AUI component

SuggestedRemedy

Change "PMD or AUI component" to "AUI component or PMD" in the following places:
174A.9.5 first paragraph
174A.9.6 first paragraph
174A.9.7 first paragraph
Table 174A-1 footnote a
Table 174A-2 footnote a

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **174A** *SC* **174A.9.5** *P* **747** *L* **41** # 282

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(B1) (CK)*

Hmax(k) is introduced but we don't say what Hmax(k) is!

SuggestedRemedy

Add sentence-Hmax(k) is the probability of maximum symbol errored, where k denotes number of errored symbol in a frame.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
This might be clarified further. First by changing the variable name BER to BER_max. Then explaining that the mask is the limit given a BER equal to BER_max.
Change the variable name BER to BER_max. Update this variable name through the draft as appropriate.
Add the following sentence:
"H_max(k) is the probability of k error test symbols in a test block with given random bit errors with a BER equal to BER_max."
In the paragraph above, change the second sentence to:
"Compliance is determined by measuring an error histogram on each lane H_m(i)(k) and comparing the measured histogram to a calculated limit mask H_max(k)."

Cl **174A** *SC* **174A.9.7** *P* **748** *L* **40** # 190

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *(B1) (CK)*

If the Block error ratio for single lane method fails the PMD or AUI could still pass the multilane test (174A.9.6). It would be good to state that.

SuggestedRemedy

Add to the end of the last paragraph. "If this test fails, then the performance may be further verified using the method in 174A.9.6."

Response *Response Status* **W**

ACCEPT.

Cl **174A** *SC* **174A.13** *P* **755** *L* **12** # 220

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *(B1) (CK)*

The BER for entire PCS-to-PCS path should be given with greater precision, to correspond to BER_added used for AUI-C2C.

SuggestedRemedy

Change 2.92e-4 to 2.921e-4, in both Table 174A-1 and Table 174A-2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy and update the BER value throughout the draft as appropriate.
Implement with editorial license.
[Editor's note: CC: 178, 179, 180, 182, 185, 174A]

Cl **175** *SC* **175.2.4.1** *P* **287** *L* **18** # 209

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *(B1) (L)*

Here "The transmit PCS may use either the state-diagram encoder defined by Figure 119-14 or the stateless encoder defined in 119.2.4.1.2"
In 119.2.4.1 "The transmit PCS generates 66-bit blocks using either the state-diagram encoder defined in 119.2.4.1.1 or the stateless encoder defined in 119.2.4.1.2"

The text should be consistent in referring to a subclause rather than a figure for the definition.

Note that 172.2.4.1 also uses subclause references.

SuggestedRemedy

Change "defined by Figure 119-14" to "defined in 119.2.4.1.1".

Response *Response Status* **C**

ACCEPT.

Cl **175** *SC* **175.2.6.2.2** *P* **299** *L* **47** # 362

Opsasnick, Eugene — Broadcom

Comment Type **E** *Comment Status* **A** *PCS state variables (L)*

The variable restart_lock is set by a state diagram but can also be set if any the restart_lock<z> is set. This is hard to follow because it is set by both the state diagram and by its own defintion based on another variable that is set by a different state diagram. Also, the naming of the restart_lock and restart_lock<z> should be changed since they are different variables with names that are too similar.

SuggestedRemedy

Add a new variable in 175.2.6.2.2, deskew_failed, with the following definition:
"Boolean variable that indicates the deskew process failed to identify 16 unique PCS lanes and is used to set the restart_lock variable. The value of deskew_failed is set by the PCS synchronization state diagram (see Figure 175-8)."

In Figure 175-8, replace the restart_lock variable with the new deskew_failed variable in the LOSS_OF_ALIGNMENT and DESKEW_FAIL states.

Change the name of the "restart_lock<z>" variable to "three_bad_cw<z>" in 175.6.2.2 and in Figure 175-9.

Change the definition of the restart_lock variable from:
"Boolean variable that is set by the PCS synchronization state diagram (see Figure 175-8) to restart the alignment marker lock process on all PCS lanes. It is set to true in the DESKEW_FAIL state or if restart_lock<z> is true for any z. It is set to false upon entry into the LOSS_OF_ALIGNMENT state."
To:
"Boolean variable that is used to restart the alignment marker lock process on all PCS lanes in Figure 119-12. Its value is set to true if deskew_failed is true or if three_bad_cw<z> is true for any z. Otherwise, this variable is set to false."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

The CRG reviewed slides #28-31 of the editorial presentation at:
https://www.ieee802.org/3/dj/public/25_11/opsasnick_3dj_01_2511.pdf

Implement the changes on slides 30 and 31 of opsasnick_3dj_01_2511 with editorial license.

Cl **175A** *SC* **175A** *P* **757** *L* **52** # 309

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **E** *Comment Status* **A** *(B1) (L)*

In the equations, cx_C should correspond to c_C, instead of c_A. Besides, cx_D should correspond to c_D, instead of c_B

SuggestedRemedy

Change c_A to c_C in Line 52;
Change c_B to c_D in Line 53.

Response *Response Status* **C**

ACCEPT.

Cl **175A** *SC* **175A** *P* **761** *L* **18** # 310

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **T** *Comment Status* **A** *(B1) (L)*

After my checking, I found that the hexadecimal representation of codeword A assumes that bit<9> is the first transmitted bit in each RS symbol. However, bit<0> should be the first transmitted bit per 175.2.4.7 (Line 17, Page 294). In Annex 175A, it is also mentioned that the most significant bit of each hex symbol is transmitted first (Line 16, Page 757). So, the codeword examples should be consistent with what is defined.

SuggestedRemedy

Revise the hexadecimal representation of all codeword examples in Table 175A-3, Table 175A-4, Table 175A-5, Table 175A-6 such that bit<0> is transmitted first.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The hexadecimal representations of the the codewords A, B, C, and D are consistent with the examples in Annex 119A and 172A and should not be changed. There is, however, a typo in lines 50-53 on page 757 where the indexes of the codeword symbols are listed as <9:0> and should be <0:9>.

Change "cxA <(10i+9):(10i)> = c_A<i><9:0>" to "cxA <(10i+9):(10i)> = c_A<i><0:9>" on line 50.
Change "cxB <(10i+9):(10i)> = c_B<i><9:0>" to "cxB <(10i+9):(10i)> = c_B<i><0:9>" on line 51.
Change "cxC <(10i+9):(10i)> = c_A<i><9:0>" to "cxC <(10i+9):(10i)> = c_C<i><0:9>" on line 52.
Change "cxD <(10i+9):(10i)> = c_B<i><9:0>" to "cxD <(10i+9):(10i)> = c_D<i><0:9>" on line 53.

Note that changes to lines 52 an 53 also fix another typo on the right-hand side of the equantion where "A" should be "C" and "B" should be "D" as pointed out in comment #309.

Implement with editorial license.

Cl **176** *SC* **176.4.1** *P* **319** *L* **43** # 430

Nicholl, Gary — Cisco Systems

Comment Type **T** *Comment Status* **A** *(B1) (L)*

Figure 176-2. In the footnote, " inst: PMA or PMD or FEC or AUI" , inst cannot be "AUI" as "AUI" is not a sublayer.

SuggestedRemedy

Delete "AUI" from the footnote " inst: PMA or PMD or FEC or AUI" in Figure 176-2.

Make a similar change to Figure 176-12 and Figure 176-13.

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.4.4.2.1** *P* **331** *L* **13** # 363

Opsasnick, Eugene — Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

Update the definition of deskew_enable_mux to follow the guidelines adopted during D2.1 comment resolution.

SuggestedRemedy

Change the definition of variable deskew_enable_mux
From:
"Boolean variable that is set to true in the DESKEW state (see Figure 176-10) to start the deskew process. Otherwise it is set to false."
To:
"Boolean variable that is used to start the deskew process. Its value is set by the PMA multiplex synchronization state diagram (see Figure 176-10)."

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.4.4.2.1** *P* **331** *L* **24** # 364

Opsasnick, Eugene — Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

Update the definition of restart_lock_mux to follow the guidelines adopted during D2.1 comment resolution.

SuggestedRemedy

Change the definition of variable restart_lock_mux
From:
"Boolean variable that is set in the state diagram shown in Figure 176-10. The variable is set to true when the lane synchronization process fails to lock, and is set to false upon entering the
LOSS_OF_ALIGNMENT state, causing the alignment marker lock process to restart on all input lanes."
To:
"Boolean variable that indicates the lane synchronization process has failed and is used to restart the alignment marker lock process on all input PCS lanes (see 176.4.2.2). Its value is set by the PMA multiplex synchronization state diagram (see Figure 176-10)."

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.7.1** *P* **338** *L* **36** # 431

Nicholl, Gary — Cisco Systems

Comment Type **T** *Comment Status* **A** *(B1) (L)*

Figure 176-13, footnote d. I assume that block error counters are only applicable to 200G/lane interfaces and therefore not to a 1.6AUI-16 ?

SuggestedRemedy

Update 176.7.4.7 to make it clear that block error detection and counters do not apply to 1.6TAUI-16, i.e. to 100Gb/s lanes ? Maybe this is already implicit in that the term "PAML" only refers to 200Gb/s lanes ? Perhaps adding a note to call out the exception for the 1.6TAUI-16 would be the simplest way to address this.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In 176.7.4.7, the block error counters are defined per PMAL, where a PMAL is a PMA lane running at 212.5G. Hence, these counters are not available for PMA lanes running at 106.25G as in the case of 1.6BASE-R 16:16 PMA. However, this is a subtle point, and could be made more explicit, to avoid confusion.

Change the first sentence in 176.7.4.7
From:
"The PRBS31 test pattern checker in each PMAL shall include block error detection and 17 related counters."
To:
"The PRBS31 test pattern checker in each PMAL (see 176.1.3) shall include block error detection and 17 related counters."

Cl **176** *SC* **176.11** *P* **344** *L* **13** # 429

Nicholl, Gary — Cisco Systems

Comment Type **T** *Comment Status* **A** *(B1) (L)*

There is a discrepency between the set of MDIO registors assigned for the block error counters in Table 176-9 (1.2600-1.3007) and the block of registers defined in 45.2.1.267 (1.2650-1.3057).

SuggestedRemedy

Assuming that 45.2.1.267 is correct, then update the MDIO registers for the block error counters in Table 176-9 to match those in 45.2.1.267.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **176** *SC* **176.11** *P* **344** *L* **13** # 428

Nicholl, Gary — Cisco Systems

Comment Type **T** *Comment Status* **A** *PMA counters (L)*

In order to support PMAs such as "1.6TBASE-R 8:8" an additional set of block error counters are required (see Figure 176-13), one set for the PMA service interface (i.e. transmit direction of the PMA) and one set for the service interface below the PMA (i.e. the receive direction of the PMA).

SuggestedRemedy

In Table 176-9, insert an additional set of block error counters (17 counters per lane and 8 lanes in total). Add a corresponding set of MDIO registors in Clause 45.

To distinguish between the two sets of counters (one set in the transmit direction and one set in the receive direction), use the following variable names "test_block_error_bin_tx_i_k" and "test_block_error_bin_rx_i_k" respectively.

Update 176.7.4.7 and 45.2.1.267 as necessary.

Also consider simplifying "test_block_error_bin" to "block_error_bin" throughout the document. I think the word "test" is unnecessary, and shorter variable names are preferred.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The naming of "test_block_error_bin" for these counters is useful to distinguish them from other counters related to functional/mission mode and should remain. As mentioned in the comment a second set of error counters are needed to support physical interfaces on both sides of the PMA.

Implement a second set of error counters as described in the suggested remedy with editorial license.

[Editor's note: CC: 45]

Cl **176B** *SC* **176B.3** *P* **772** *L* **50** # 165

Ofelt, David — Juniper Networks / HPE

Comment Type **TR** *Comment Status* **A** *legacy 100 ppm (L)*

This sub-clause is "Special case for 200GBASE-R, 400GBASE-R, and 800GBASE-R PMAs" which discusses the bit-mux to symbol-mux conversion needed for 200GBASE-R and 400GBASE-R interfaces. There are actually two incompatible sets of 200GBASE-R and 400GBASE-R PMAs- one based on 100ppm signaling and the other on 50ppm signaling. The rest of the clause is accurate for the second (50ppm) group and shows that you just need a PMA-BM in addition to a PMA-SM to convert between the generations. For the first group (100ppm) there also needs to be a XS inserted in order to rate match between the different ppm domains. It would be useful to add some text to this part of 176B to indicate that the 100ppm interfaces need an XS - this would be similar to the text we added to 120.1.4

SuggestedRemedy

Add a new subclase either under or after 176B.3 called "Special case for 200GBASE-R and 400GBASE-R using 100ppm signaling" with text indicating that an XS is required to rate match between ppm domains. Detailed suggestions for the text will come in a presentation.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The CRG reviewed the presentation at https://www.ieee802.org/3/dj/public/25_11/ofelt_3dj_01_2511.pdf.

Implement slides 7-11 in ofelt_3dj_01_2511 with editorial license.

Cl **176C** *SC* **176C.3** *P* **792** *L* **50** # 55

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

The Annex 178b name changed

SuggestedRemedy

In the note change: "C2C components include the inter-sublayer link training (ILT) function for a Type E1 interface, specified in Annex 178B"
To: "C2C components include the path startup (PSU) functions with Type E1 format, specified in Annex 178B

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **176C** *SC* **176C.3** *P* **792** *L* **50** # 411

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *(B1) (E)*

E1 is defined as "format" in 178B.7.3.2.
Also in 176D.3, 176D.8.7.

SuggestedRemedy

Change "for a Type E1 interface" to "with E1 format", with editorial license.
[CC 176C, 176D]

Response *Response Status* **C**

ACCEPT.
[Editor's note: CC: 176C, 176D]

Cl **176C** *SC* **176C.4** *P* **794** *L* **3** # 334

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (E)*

RTS function status is now rts_status

SuggestedRemedy

Change training_status to rts_status

Response *Response Status* **W**

ACCEPT.

Cl **176C** *SC* **176C.6.3.1** *P* **796** *L* **41** # 57

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **A** *(B1) (E)*

Type #1 is not defined in section 179.8.9, or any place else in the document.

SuggestedRemedy

Change: "(ILT) function for Type #1 interface as defined in 179.8.9"
To: "(ILT) function with E1 format as defined in 179.8.9"

Response *Response Status* **W**

ACCEPT.

Cl **176C** *SC* **176C.6.4.2** *P* **799** *L* **9** # 109

Kutscher, Noam Marvell

Comment Type **E** *Comment Status* **A** *(B1) (E)*

The name - "low loss test channel" was changed on the previous draft

SuggestedRemedy

rephrase "low loss test channel" to "Test L low loss test channel"

Response *Response Status* **C**

ACCEPT.

[Editor's note: Changed page from 391 to 799]

Cl **176C** *SC* **176C.6.4.5.2** *P* **802** *L* **37** # 181

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *(B1) (E)*

Incorrect reference. The jitter values are not provided in Table 176C-7 and the correct reference (Table 176C-2) has different jitter values for the different packages.

SuggestedRemedy

Change "Table 176C-7" to "Table 176C-2 for package A"

Response *Response Status* **C**

ACCEPT.

Cl **176D** *SC* **176D.3** *P* **814** *L* **20** # 58

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

The Annex 178b name changed

SuggestedRemedy

In the note change: "C2M components include the inter-sublayer link training (ILT) function with E1 format as specified in Annex 178B"
To: "C2M components include the path startup (PSU) functions with Type E1 format, specified in Annex 178B"

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **176D** *SC* **176D.3** *P* **814** *L* **46** # 107

Kutscher, Noam Marvell

Comment Type **T** *Comment Status* **R** *(B1) (E)*

There are no values for the connector, host and module

SuggestedRemedy

specify what's the budjet of all as done on 802.3ck-2022 page 244

Response *Response Status* **C**

REJECT.
The comment addresses Figure 176D-2, which illustrates the component of a 200 Gb/s per lane AUI-C2M link, without any loss numbers. The loss budget appears in a separate diagram, Figure 176D-6, and is defined as a reference (and real channels are not expected to be measurable).

The suggested remedy points to Figure 120G-2, which include loss values for the host, module, and connector, summing up to 16 dB (excluding package losses). The loss values in this figure are not specifications, and are described as "ILdd loss budget associated with the C2M application". Thus it mixes architectural illustration of components and informative values. In Annex 176D it was decided to avoid that mix and use separate figures. See the response to comment #115 against D1.1 in <https://www.ieee802.org/3/dj/comments/D1p1/8023dj_D1p1_comments_final_id.pdf#page=25>, the related comments #412 and #515, and the reference presentation <https://www.ieee802.org/3/dj/public/24_09/ran_3dj_03a_2409.pdf>.

Cl **176D** *SC* **176D.3** *P* **814** *L* **52** # 75

Brown, Matt Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (E)*

The word "components" is overloaded in the title since the diagram includes a host C2M component, and module C2M component, a channel, a connector, etc. The title used in FIgure 176C-2 would serve as good template.

SuggestedRemedy

Change the title of Figure 176D-2 to "200 Gb/s per lane AUI-C2C link diagram"

Response *Response Status* **C**

ACCEPT.

Cl **176D** *SC* **176D.4** *P* **815** *L* **13** # 335

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *psu rts_status (B1) (CI)*

RTS function status is now rts_status

SuggestedRemedy

Change training_status to rts_status

Response *Response Status* **W**

ACCEPT.

Cl **176D** *SC* **176D.6.2** *P* **817** *L* **26** # 76

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (E)*

The last sentence refers 179B.4 which defines the mated test fixture (MTF). Like the previous sentences it would be good to relate the mated compliance board defined here to the MTF defined in 179B.4.

SuggestedRemedy

Change the sentence to "The mated compliance board characteristics are described in 179B.4 where the mated compliance board is equivalent to the mated test fixture (MTF)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change from
"The mated compliance board characteristics are described in 179B.4"
to
"The characteristics of the compliance boards (HCB and MCB) in mated state are described in 179B.4, where the mated compliance boards are equivalent to the mated test fixtures (MTF)".

Cl **176D** *SC* **176D.6.4** *P* **818** *L* **27** # 77

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (E)*

In Table 176D-2, for the "transmitter output waveform, the cross-reference is unnecessarily repeated for each parameter associated with the transmitter output waveform and is inconsistent with the jitter parameters below. It would be helpful to highlight that all of these are defined in one subclause.

SuggestedRemedy

Reduce to one cross-reference in the cell and align with "Transmitter output waveform". Repeat for Table 176D-3, Table 179-7, and Table 178-6.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In tables outside of Annex 176D two separate subclauses are referenced (179.9.4.1.4 and 179.9.4.1.5), so the suggested remedy cannot be applied as is.
However, the two "absolute value of step size" sub-rows (min and max) can be merged to a single row with a range, which correspond to the text in the referenced 179.9.4.1.4.

Implement the suggested remedy in Table 176D-2 and Table 176D-3.
In Table 176D-2, Table 176D-3, Table 179-7, Table 178-6, and Table 176C-2, merge the two "absolute value of step size" sub-rows (min and max) a single row "range" row.

Implement with editorial license.

Cl **176D** *SC* **176D.7.1** *P* **821** *L* **27** # 406

Swenson, Norman — Nokia, Point2

Comment Type **TR** *Comment Status* **A** *Loss budget (E)*

The depiction of the connector in Figure 176D-6 is inconsistent with the connector shown in other figures in the document (e.g., Figures 120C-2, 135E-2,135G-2, . The end point of the Host channel loss is ambiguous.

SuggestedRemedy

Change Figure 176D-6 to that shown to the right. Change the note under the figure to read: "NOTE-For loss budgeting purposes, the Host channel loss is from TP0d to the center of the edge connector of the module.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The CRG reviewed slides 2-8 of the contribution <https://www.ieee802.org/3/dj/public/25_11/swenson_3dj_01a_2511.pdf>.

A proposed substitute for Figure 176D-6 has been attached to the comment. The difference is a vertical line in the middle of the "connector" rectangle.

Implement the suggested remedy with editorial license, considering the responses to other comments.

Cl **176D** *SC* **176D.8.3** *P* **826** *L* **24** # 405

Swenson, Norman — Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(B1) (E)*

The text refers to the MDI connector of the test fixture, but for this annex, the test fixture does not have an MDI connector. The MDI is below the PMD as shown in Figure 176D-1.

SuggestedRemedy

Change
"the discontinuity of the MDI connector"
to
"the discontinuity of the AUI-C2M connector"

Response *Response Status* **W**

ACCEPT.

Cl **177** *SC* **177.1.3** *P* **351** *L* **3** # 293

Maki, Jeffery — Juniper Networks

Comment Type **E** *Comment Status* **A** *(B1) (L)*

"outer RS-FEC" is used with outer as an adjective except many workers think outer is part of compound noun since Inner FEC is defined as a compound noun (term).

SuggestedRemedy

Clarify the use of outer. Is Outer FEC a defined compound noun (term) or not?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

We do not use the term "outer" in the draft when referring to the RS-FEC that is included in a PCS. In this sentence the word "outer" is not necessary and should be removed.

Change the first sentence of 177.1.3
From:
"The Inner FEC provides a second layer of FEC protection without decoding the data encoded by the outer RS-FEC in the PCS."
To:
"The Inner FEC provides a second layer of FEC protection without decoding the data encoded by the RS-FEC in the PCS."

Cl **177** *SC* **177.2.** *P* **353** *L* **41** # 210

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

The new NOTE added after Table 177-1 says "A value of OK for the SIGNAL_OK <...> does not guarantee that the stream provided to the Inner FEC sublayer through PMD:IS_UNITDATA_i.indication is a valid signal".

This sentence is incorrect: the PMD below the clause 177 inner FEC is one of 800GBASE-DR4-2, 800GBASE-FR4, or 800GBASE-LR4, all of which include the ILT function, and thus SIGNAL_OK=OK means that ILT has completed and "mission data" is being received (or about to be), so it is definitely a valid signal; arguably the quality of the signal is not guaranteed by the PMD, but that is never guaranteed and is not worth mentioning.

This sentence does not match the service interface definitions in 182.3 and 183.3

SuggestedRemedy

Change the NOTE to state that a value of OK means the PMD has completed the path startup procedure, and any other information that is worth menioning, with editorial license.

Alternatively, detete the NOTE.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Delete the NOTE under Table 177-1.

Cl **177** *SC* **177.4.5** *P* **358** *L* **32** # 195

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *(B1) (L)*

"preceding equation": The equation defining p<7:0> should be numbered to enable referencing it

SuggestedRemedy

Format the paragraph of line 30 as "Equation" to make it a numbered equation, and refer to that equation.

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.5** *P* **358** *L* **32** # 196

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *(B1) (L)*

I assume that generation of the parity bits in the Hamming code is done using XOR operations across the participating bits as in most error correcting codes. The text in this subclause explains the calculation in detail and then states that the " " denotes a matrix dot multiplication.
The problem is that matrix multiplication inherently involves addition; If readers don't already know what the " " operator does, they might interpret it as matrix multiplication using "normal" addition, rather than XOR (addition in GF(2)). Especially since XOR is used in the second paragraph of this subclause without referring to it as addition.

SuggestedRemedy

Indicate that the addition operation inside the matrix multiplication is done modulo 2, or in GF(2), or is an XOR operation.

Implement with editorial license (since this may require text outside of the "where" paragraph to align with the previous use of XOR).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add a sentence " the addition operation inside the matrix multiplication is an XOR operation."
Implement with editorial license.

Cl **177** *SC* **177.4.7.2** *P* **360** *L* **48** # 197

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **A** *IFEC scrambler (L)*

"a self-synchronizing PRBS13 scrambler as shown in Figure 94-6": the figure does not show a "self-synchronizing" (multiplicative) scrambler, only the LFSR that generates the PRBS13 - which can be interpreted incorrectly as an additive scrambler. Referring to this figure can lead readers to wrong conclusions.

The term "self-synchronoizing" describes a descrambler, but here there is no specificaiton of a descrambler. Thus, "multiplicative scrambler" is preferable.

The suggested remedy keeps the definition as it is (a multiplicative scrambler). As an alternative remedy, since the input to this scrambler is always zeros (we have not specified any other input), it can be replaced with a simple PRBS13 sequence. This would be a simpler definition and would not require a new figure. Any future use of the pad bits that would modify the pattern will need to redefine the input bits and add a descrambling operation to extract them. which would be significant changes.

SuggestedRemedy

Change "a self-synchronizing PRBS13 scrambler as shown in Figure 94-6 and using the polynomial defined in Equation (94-3)" to "a multiplicative scrambler using the polynomial defined in Equation (94-3)".

Consider adding a new figure here, based on Figure 94-6 but showing a multiplicative scrambler (input XORed with the feedback).

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The CRG reviewed slides #25-27 of the editorial presentation at:
https://www.ieee802.org/3/dj/public/25_11/opsasnick_3dj_01_2511.pdf

Add a new figure to show the data input XORed with the feedback.
Change "a self-synchronizing PRBS13 scrambler as shown in Figure 94-6 and using the polynomial defined in Equation (94-3)" to "a self-synchronous scrambler using the polynomial defined in Equation (94-3) and shown on slide #27 of opsasnick_3dj_01_2511.

Implement with editorial license.

Cl **177** *SC* **177.5.5** *P* **364** *L* **18** # 393

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *(B1) (L)*

The Inner FEC total_bits counter, correct_bits counter, and bin counters should be qualified by the Inner_FEC_sync_status variable being true. The Inner_FEC_corrected_cw_counter and INNER_FEC_uncorrected_cw_counter are already qualified by this variable being true.

SuggestedRemedy

Change the first sentence in the definition of Inner_FEC_total_bits_counter
From:
"A 64-bit counter that counts once for each bit processed by the Inner FEC decoder."
To:
"A 64-bit counter that counts once for each bit processed by the Inner FEC decoder when Inner_FEC_sync_status is true."

Change the first sentence in the definition of Inner_FEC_corrected_bits_counter
From:
"A 64-bit counter that counts once for each bit modified by the Inner FEC decoder."
To:
"A 64-bit counter that counts once for each bit modified by the Inner FEC decoder when Inner_FEC_sync_status is true."

Change the first sentence in the definition of Inner_FEC_codeword_error_bin_k
From:
"A set of four 32-bit counters where counter k counts once for each codeword received with exactly k bits corrected (flipped) when fas_lock is true (k = 0 to 3)."
To:
"A set of four 32-bit counters where k = 0 to 3. While Inner_FEC_sync_status is true, Inner_FEC_codeword_error_bin_k counts once for each codeword received with exactly k bits corrected (flipped)."

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.5** *P* **364** *L* **26** # 367

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

The defintion of Inner_FEC_cw_counter states:
"A 48-bit counter that counts once for each FEC codeword received when alignment_status is true."

However, there is no definition of a variable called "alignment_status" in Clause 177. It looks like it should actually be referencing the variable Inner_FEC_sync_status.

SuggestedRemedy

Change the the definition of Inner_FEC_cw_counter
From:
"A 48-bit counter that counts once for each FEC codeword received when alignment_status is true."
To:
"A 48-bit counter that counts once for each FEC codeword received when Inner_FEC_sync_status is true."

Response *Response Status* **W**

ACCEPT.

Cl **177** *SC* **177.10** *P* **372** *L* **29** # 419

Shrikhande, Kapil — Marvell Technologies

Comment Type **T** *Comment Status* **A** *FEC MDIO registers (L)*

The name of the variable "FEC_corrected_cw_counter (Inner FEC lane 0)" used to be "Inner_FEC_corrected_cw_counter (Inner FEC lane 0)" in D2.1. The "Inner_FEC" preceding the counter name was removed in D2.2. Similar counters for Inner FEC lanes 1-7 continue to have "Inner_FEC" in the name. It seems the variable name for lane 0 was changed (in D2.2) due to the MDIO register being shared between the Cl177 Inner FEC and the Cl186 ER1 FEC. It is confusing to have the Lane 0 counter named differently from the counters for Lanes 1-7. The other confusion is that the variable name in the referenced sub-clause, 177.5.5, has "Inner_FEC" in the name. The same issue in naming is also present in the subsequent 3 counters in Table 177-8 , these are for uncorrected cw counter, total bits counter and corrected bits counter.

SuggestedRemedy

There is perhaps no good solution here other than creating new MDIO registers for the CL186 ER1 FEC, so that Cl177 Inner FEC can have its unique MDIO registers, and the names of the Inner FEC lane 0 counters in Table 177-8 can go back to using the D2.1 convention and will match the names of the counters for Lanes 1-7 and the variable name in 177.5.5. If this cannot be done (for some reason), consider adding a footnote under Table 177-8 to explain the naming quirk.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the name of the following status variables in Table 177-8:
From:
"FEC_corrected_cw_counter (Inner FEC lane 0)"
"FEC_uncorrected_cw_counter (Inner FEC lane 0)
"FEC_total_bits_counter (Inner FEC lane 0)"
"FEC_corrected_bits_counter (Inner FEC lane 0)"
To:
"Inner_FEC_corrected_cw_counter (Inner FEC lane 0)"
"Inner_FEC_uncorrected_cw_counter (Inner FEC lane 0)
"Inner_FEC_total_bits_counter (Inner FEC lane 0)"
"Inner_FEC_corrected_bits_counter (Inner FEC lane 0)"

Change all references to these variables to use the correct names with editorial license.

Cl **177** *SC* **177.10** *P* **372** *L* **29** # 171

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *FEC MDIO registers (L)*

Some of the status variable counter names in table 177-8 were changed from "inner_FEC .." to just "FEC.." in draft 2.2 This was done based on comment #286. However they are still called "inner FEC" in the referenced section 177.5.5.

SuggestedRemedy

Make the names consistent. For preference revert to "inner_ FEC ..." however changing the names in 177.5.5 and anywhere else they are used would be another option, but note that they are called "inner_FEC in the equivalent table 184-5 in clause 145..

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #419.

Cl **177** *SC* **177.10** *P* **375** *L* **29** # 172

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *FEC MDIO registers (L)*

delay names in table 177-8 were changed from "inner FEC .." to just "FEC.." in draft 2.2 based on comment #287 to align with descriptions in clauses 45, but they are still called "inner FEC" in the referenced section 177.9

SuggestedRemedy

Make the names consistent. Change the names to just FEC in 177.9 and anywhere else they are used if consistency with clause 45 is needed. (I do wonder however how clause 45 handles both the RS FEC delay and the Inner FEC delay Aren't two different sets of registers needed). Note that in clause 184 "Inner_FEC" is used in both the equivalent table and in the descriptive sections.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #419.

Cl **177** *SC* **177.10.** *P* **372** *L* # 198

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *FEC MDIO registers (L)*

The implementation of comment #266 against D2.1 changed the names of some of the variables in lane 0 (deleting the prefix "Inner_")., but not all variables, and the variable names in lanes 1-7 were note changed at all. I assume this was not the intent.

Also, the references for the variables whose names were modified are 177.5.5 and 177.9, which both still use the original names.(with "Inner_").

SuggestedRemedy

Align all variable names in all lanes, either with "Inner_" or without. Use the same names in 177.5.5 and 177.9.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #419.

Cl **178** *SC* **178** *P* **383** *L* **37** # 151

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *psu rts_status (B1) (CI)*

The SIGNAL_OK parameters is set based on rts_status managed by the RTS function.

SuggestedRemedy

Change "training_status of the inter-sublayer training function"
To "rts_status of the RTS function"
Make similar changes at:
Clause 179 page 416 line 26
Clause 180 page 460 line 6
Clause 181 page 501 line 2
Clause 182 page 531 line 14
Clause 183 page 563 line 8
Annex 176C page 794 line 3
Annex 176D page 815 line 13

Response *Response Status* **W**

ACCEPT.
[Editor's note: CC: 178, 179, 180, 181, 182, 183, 176C, 176D]

Cl **178** *SC* **178.4** *P* **383** *L* **37** # 328

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *psu rts_status (B1) (CI)*

RTS function status is now rts_status

SuggestedRemedy

Change training_status to rts_status

Response *Response Status* **W**

ACCEPT.

Cl **178** *SC* **178.6** *P* **384** *L* **14** # 73

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *pause quanta (B1) (E)*

In Table 178-5, footnote b defines pause_quanta as "See 31B.2 for the definition of pause_quanta." This reference gives rather ambiguous definition. Instead, Table 169.4 and Table 174-4 point to 1.4.459 which give a more clear definition. Note also that sublayers defined in clauses 175 through 177 and 180 through 187 do not define pause_quanta locally and rather rely upon the reference to clause 169 and 174 for the definition.

SuggestedRemedy

In Table 178-5, Table 179-5, Table 176C-1, and Table 176D-1 do one of the following:
(1) Change "31B.2" to "1.4.459"
(2) Delete "See 31B.2 for the definition of pause_quanta." from the footnote.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "31B.2" to "1.4.459" in footnote b of Tables 178-5, 179-5, 176C-1, 176D-1.

[Editor's note: CC: 176C, 176D, 178, 179]

Cl **178** *SC* **178.7** *P* **384** *L* **24** # 74

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (E)*

There is no FEC lane. This is likely text copied from a previous clause define 100GBASE-R PMDs.

SuggestedRemedy

Change "PCS or FEC" to "PCS", three times.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.3.3** *P* **391** *L* **52** # 106

Kutscher, Noam Marvell

Comment Type **E** *Comment Status* **A** *RX ATOL (B1) (E)*

The name - "low loss test channel" was changed on the previous draft

SuggestedRemedy

rephrase "low loss test channel" to "Test L low loss test channel"

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.3.3** *P* **392** *L* **7** # 173

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *RX ATOL (B1) (E)*

It would be clearer to the reader if the note followed the description of how the transmit equalization is adjusted.

SuggestedRemedy

Reverse the order of the note paragraph and the final paragraph of 178.9.3.3. Making the note paragraph the last one in the section. Make equivalent changes in 179.9.5.2, 176C.6.4.2 and 176D.8.12

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.3.4** *P* **392** *L* **21** # 166

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *Error Ratio Testing (CK)*

The test methods in 174A.9.5 or 174A.9.7 are called out (single lane tests) but the multilane test is 174A.9.6 is not mentioned. However 174A.9.5 states that if the single lane test fails the multilane test in 174A.9.6 can be used. It is somewhat ambiguous if this multilane test can be used.

SuggestedRemedy

Change "174A.9.5 or 174A.9.7" to "174A.9.5 or 174A.9.6 or 174A.9.7" Make this change here and in 178.9.3.3, 178.9.3.4 and in all equivalent places in clauses 178, 179, 180, 181,182 and 183.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The block error ratio test defined in 174A.9.6 is for that aggregate of all lanes of a multi-lane PHY.

It is unclear in Clause 178 as to whether the multi-lane test is valid or not. It might therefore be reasonable adopt the changes proposed in the suggested remedy.

However, for the receiver sensitivity test and stressed receiver test in clauses 180 through 183 the test is specifically for a single lane (or "each lane" per tables 180-8, 181-6, 182-8 and 183-7).

Implement the suggested remedy for interference tolerance and jitter tolerance tests in clauses 178, 179 and annexes 176C, 176D and for receiver sensitivity and stressed receiver sensitivity in clauses 180, 181, 182, 183.

Implement with editorial license.

[Editor's note: CC: 179, 180, 181, 182, 183]

Cl **178** *SC* **178.14.4.5** *P* **409** *L* **27** # 3

Lusted, Kent — Synopsys

Comment Type **TR** *Comment Status* **A** *(B1) (E)*

PICS Item CC2 for "AC-coupling" has a value/comment entry containing "100 kHz". However, the resolution to comment #389 against D2.1 set the value to 250 kHz in Table 178-11 and Table 176C-6. The PICS entry was not updated accordingly. (see: https://www.ieee802.org/3/dj/comments/D2p1/8023dj_D2p1_comments_final_id.pdf#page=102)

SuggestedRemedy

Change the value/comment entry for PICS item CC2 from:
"Between TP0d and TP5d, 3 dB cutoff frequency less than 100 kHz"
to:
"Between TP0d and TP5d, 3 dB cutoff frequency less than 250 kHz"

Also update the referenced Subcaluse to be 178.10.5

Response *Response Status* **W**

ACCEPT.

Cl **178** *SC* **178.14.4.5** *P* **409** *L* **29** # 357

Li, Tobey — MediaTek

Comment Type **E** *Comment Status* **A** *(B1) (E)*

In item CC3, reference to AC coupling, 93.9.4, is outdated. Maximum AC coupling frequency does not match the value in referenced subclause, which was changed to 250 kHz.

SuggestedRemedy

Update referenced subclause to 178.10.5. Change maximum cutoff frequency to 250 kHz.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B** *P* **879** *L* **18** # 345

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

In the initiali condition setting request response step b) specifies that coef_sts response will be not-updated. However the initial condition setting reponses process specified in 178B.7.8.2 states if ic_req is not supported (CHECK_REQ returns false) then the reponse will be coeff_not_supported. So the text in 178B.7.8.1 needs to be updated to align with that being a possible response. Follow up on unsatisifed comment #477 from D2.1.

SuggestedRemedy

add "or "coefficient not supported" " to the end of item b)

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B** *P* **893** *L* **54** # 353

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

MDIO table says the offset is 2800 in the footnote but 45.2.1.272 uses an offset of 4000.

SuggestedRemedy

Change 2800 to 4000 in the footnote a of Table 178B-6

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
In Clause 45 the "lower AUI component" is named "bottom AUI component". To make the document self-consistent "bottom AUI component" should be renamed to "lower AUI component" in 45.2.1.272 (two instances).

Change 2800 to 4000 in the footnote a of Table 178B-6.
Change "bottom AUI component" in 45.2.1.272 to "lower AUI component" (two instances).

Implement with editorial license.

[Editor's note: CC: 45]

[Editor's note: Changed page/line from 0/0 to 893/54.]

Cl **178B** *SC* **178B.2** *P* **863** *L* **18** # 412

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *psu Naming (CI)*

"Path startup" is a poor term for what is defined by this annex. Paths have been started up before the functionality in this annex was specified. Also, the acronym is in conflict with the well-known Power Supply Unit.

The functionality can be better described as "Autonomous path startup", or "Auto path startup" (parallel to Auto-Negotiation), which would result in the acronym APS. APS seems to be an available acronym (except maybe EAPS, "Ethernet Automatic Protection Switching").

The annex name may be changed accordingly but can also stay as it is.

SuggestedRemedy

Rename "Path startup" to "Autonomous path startup" and "PSU" to "APS".
Implement across the draft with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

A straw poll taken at the October 30 ad hoc meeting provides some guidance: https://www.ieee802.org/3/dj/public/adhoc/electrical/25_1030/3dj_adhoc_straw_polls_251030.pdf

Replace the term "path startup" and acronym "PSU" with the term "autonomous path startup" and acronym "APSU" throughout the draft.

Implement with editorial license.

Straw poll TF-1
I support replacing the term "path startup" and acronym "PSU" with the term "autonomous path startup" and acronym "APSU".
Yes: 55
No: 1
Abstain: 20

Cl **178B** *SC* **178B.2** *P* **863** *L* **25** # 59

Bruckman, Leon — Nvidia

Comment Type **ER** *Comment Status* **A** *(B1) (CI)*

The text "RTS status indicates when an ISL is ready, or not," can be improved

SuggestedRemedy

Change: "RTS status indicates when an ISL is ready, or not,"
To: "RTS status indicates whether an ISL is ready, or not,"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.3** *P* **863** *L* **42** # 238

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **ER** *Comment Status* **A** *(B1) (CI)*

Any terminology being defined in the annex should be identified in 178B.3.

SuggestedRemedy

Change -
"For the purpose of this annex, the following definitions apply. Refer to 1.4 for terms not defined in this annex."
to
"For the purpose of this annex, the following definitions apply. Refer to 1.4 for terms not defined in 178B.3."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Change:
"For the purpose of this annex, the following definitions apply. Refer to 1.4 for terms not defined in this annex."
To:
"For the purpose of this annex, the following definitions apply. Refer to 1.4 for terms not defined in this subclause"
Implement with editorial license

Cl **178B** *SC* **178B.3** *P* **863** *L* **53** # 352

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

Interface is pointing to Figure 178B-2 which is providing the adjacent interface and peer interfaces. Should this be pointing to Figure 178B-3.

SuggestedRemedy

Change Figure 178B-2 to Figure 178B-3.

Response *Response Status* **W**

ACCEPT.

Cl **178B** *SC* **178B.3** *P* **864** *L* **2** # 421

Shrikhande, Kapil — Marvell Technologies

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

Sentence could use a comma

SuggestedRemedy

Insert a comma as shown in the sentence below after the word "between".
An ISL is either a pair of AUI components and the AUI channel between, or a pair of PMDs (in different PHYs) and the medium between.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.4** *P* **865** *L* **2** # 234

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

It may be helpful to the reader to reiterate what is stated about PSU in 178B.2.

SuggestedRemedy

Add: PSU is not intrinsically a function; rather, it is an externally observable behavior resulting from the RTS and ILT functions.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.4** *P* **865** *L* **10** # 235

Mascitto, Marco — Nokia

Comment Type **T** *Comment Status* **R** *(B1) (CI)*

PSU applies to any Physical Layer implementation that includes at least one ISL with data rate of 200Gb/s (or higher) per lane. Furthermore, PSU applies to any Physical Layer implementation that includes at least one ISL with data rate of 200Gb/s (or higher) per lane (e.g., 1.6TBASE-DR8) and any number of ISLs for which ILT is not defined (e.g., 1.6TAUI-16 C2M).

PSU must not depend on an ISL's support of the ILT function. PSU must apply to all ISLs in the path, whether they will be trained by the ILT function or not. PSU must only depend on the ISL's support of the RTS function. Decoupling the PSU from the training simplifies the architecture and avoids the need to introduce flows in the state diagrams to allow for ISLs for which ILT is not defined by this annex.

The ILT function defines training of ISLs that make use of 200Gb/s lanes.

The RTS function must define how an ISL signals its readiness end-to-end along the path.

SuggestedRemedy

For all paths that require PSU, allow all ISLs in that path to support RTS, regardless of whether they support ILT or not. Delete "and the ILT function (see 178B.7)" from this bullet.

Response *Response Status* **C**

REJECT.
ILT must be supported for PSU. The link training part of ILT may be disabled, but the function is still active as reflected in state diagram 178B-10.

Cl **178B** *SC* **178B.4** *P* **865** *L* **15** # 320

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

local_rts is just status of the transmit path being in a state for sending data.

SuggestedRemedy

Change in the first bullet after PSU is the result...
"ready to send and receive normal data (it reached the ISL_READY state in Figure 178B-10) and propagates"

To: "ready to send data and propagates"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** SC **178B.4** P**865** L**19** # 422

Shrikhande, Kapil — Marvell Technologies

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

remote_rts "propagates similarly and independently from RS to RS in both directions". But similarly and independently to what ?

SuggestedRemedy

Assuming the sentence is meant to say remote_rts propagates similarly to and independent from local_rts, change the sentence to state that explicitly.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "remote_rts indicates that the peer interface is ready to send and receive normal data and propagates similarly and independently from RS to RS in both directions."
To: "remote_rts indicates that the peer interface is ready to send and receive normal data. It propagates from RS to RS in both directions independently of each other."

Cl **178B** SC **178B.4** P**865** L**21** # 60

Bruckman, Leon — Nvidia

Comment Type **ER** *Comment Status* **A** *(B1) (CI)*

The words "in both directions" are confusing, the text already stated that local_rts is being transmitted and remote_rts is being received.

SuggestedRemedy

Delete: "in both directions"

Response *Response Status* **W**

ACCEPT.

Cl **178B** SC **178B.6** P**867** L**28** # 415

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

facilitates the transfer

SuggestedRemedy

facilitates the indication

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** SC **178B.6** P**867** L**30** # 423

Shrikhande, Kapil — Marvell Technologies

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

Missing cross-reference

SuggestedRemedy

Add cross-reference to Figure 178B-9

Response *Response Status* **C**

ACCEPT.
[Editor's note: changed subclause from 178B.4 to 178B.6].

Cl **178B** SC **178B.6** P**867** L**42** # 319

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

Not all retimers will swap clocks.

SuggestedRemedy

Add the following after "retimer"
"that uses the recovered clock in DATA mode"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** SC **178B.6** P**867** L**45** # 321

Slavick, Jeff — Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

Needs to be "of local_status" or "of the local_status variable". Same with rts_status (which is already the rts_status variable).

SuggestedRemedy

Insert the word "variable" after local_rts.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remeday for local_rts and rts_status where appropriate.

Cl **178B** *SC* **178B.7** *P* **868** *L* **6** # 416

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

passes the readiness of the transmitter to send data

SuggestedRemedy

indicates the readiness of the transmitter to send data

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.7** *P* **868** *L* **13** # 424

Shrikhande, Kapil — Marvell Technologies

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

Missing cross-reference

SuggestedRemedy

Add cross-reference to 178B.7.3.1

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.7** *P* **868** *L* **23** # 20

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

When referring to the transmitter on the peer interface in the context of ILT various terms are used: "peer transmitter", "peer interface transmitter", "remote transmit". Mostly commonly in Annex 178B the term "peer interface transmitter" is used.

SuggestedRemedy

Change instances of "peer transmitter" and "remote transmit" to "peer interface transmitter".
Annex 178B: page 886 line 13, page 868 line 23, page 868 line 54
Clause 178: page 421 line 12
Clause 180: page 464 line 35
Clause 181: page 504 line 27
Clause 182: page 535 line 48
Clause 183: page 566 line 37

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Page 886 line 13 already names it "peer interface transmitter".
In 178B change: "peer transmitter" to "peer interface transmitter" at page 868 line 23 and at page 868 line 54.
[Editor's note: CC 178, 180, 181, 182, 183]

Cl **178B** *SC* **178B.7.2** *P* **868** *L* **53** # 417

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *(B1) (CI)*

The receiver is not strictly required to "configure its peer transmitter to optimize performance". Also, this is not the only purpose of "the frame format" - it is used for other things such as handshaking, changing from PAM2 to PAM4, and indicating readiness, which are not mentioned here.

SuggestedRemedy

Change "the frame format" to "the training protocol".
Change "is used" to "may be used".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.7.2** *P* **869** *L* **1** # 322

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

Which format is used is specified by the user of the protocol.

SuggestedRemedy

Change:
The required format is defined by the clause or annex that defines the interface.

To:
The clause or annex that defines this interfaces specifies which format is used.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.7.3.2** *P* **870** *L* **20** # 323

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

Which format is used is specified by the user of the protocol.

SuggestedRemedy

Change:
The training frame format is specified by the clause or annex that defines the interface.

To:
Which training frame format is used is specified by the clause or annex that defines the interface.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.7.3.2** *P* **870** *L* **40** # 324

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

NOTEs are not normative, but being in PAM4 mode is required.

SuggestedRemedy

Remove the words "NOTE" and make the contents of the NOTE be the last paragraph of the subclause.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.7.5** *P* **876** *L* **42** # 418

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

Three values are marked as undefined, but other fields use "reserved".

SuggestedRemedy

Change the three "undefined" to "reserved".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.7.5** *P* **876** *L* **42** # 182

Dudek, Mike — Marvell

Comment Type **ER** *Comment Status* **A** *(B1) (CI)*

The order of the Coefficient select echo entries in table 178B-4 was changed in D2.2 and no longer matches the order for the coefficient control in Table 178B-2, the natural order of the taps, or what was used for 100G in Clause 162.

SuggestedRemedy

Revert the order to match the control field.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.7.9** *P* **881** *L* **25** # 339

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

The local_mc_mode and local_tp_mode are the values sent in the status bits from the local interface in response to the received request bits. That is not clearly specified.

SuggestedRemedy

Change from:
When a change to the modulation and precoding request bits or the training pattern request bits is detected, the transmitted training pattern (see 178B.7.3.3) is chosen accordingly. To confirm that the change to the format of the training pattern was completed, the local_mc_mode variable is set to the value of the modulation and precoding request bits and the local_tp_mode variable to the value of the training pattern request bits. local_mc_mode and local_tp_mode are encoded in status fields (see 178B.7.5.2 and 178B.7.5.3).

To:
When a change to the received modulation and precoding request bits or the training pattern request bits is detected, the transmitted training pattern (see 178B.7.3.3) is set accordingly. To confirm that the change to the format of the training pattern was completed, the local_mc_mode variable is set to the value of the received modulation and precoding request bits and the local_tp_mode variable to the value of the received training pattern request bits. local_mc_mode and local_tp_mode are encoded in status fields (see 178B.7.5.2 and 178B.7.5.3).

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** SC **178B.8.2.1** P **882** L **52** # 325

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

local_rts is just status of the transmit path being in a state for sending data.

SuggestedRemedy

Remove "and receive" from the local_rts definition.

Response *Response Status* **W**

ACCEPT.

Cl **178B** SC **178B.8.2.1** P **883** L **2** # 425

Shrikhande, Kapil — Marvell Technologies

Comment Type **E** *Comment Status* **A** *(B1) (CI)*

mr_restart uses "system management" , whereas mr_training enable (few lines below) uses just "management". Both system mangement and management are intended to be the same ?

SuggestedRemedy

replace "system management" by "management"

Response *Response Status* **C**

ACCEPT.

Cl **178B** SC **178B.8.2.1** P **883** L **5** # 15

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

The statement is somewhat misleading as it might apply that beyond this annex it is defined. "The definition of unrecoverable fault is beyond the scope of this annex."

SuggestedRemedy

Change "annex" to "standard".

Response *Response Status* **W**

ACCEPT.

Cl **178B** SC **178B.8.2.1** P **883** L **16** # 426

Shrikhande, Kapil — Marvell Technologies

Comment Type **T** *Comment Status* **A** *(B1) (CI)*

Shouldn't "mr_training" be "mr_training_enable"

SuggestedRemedy

replace "mr_training" by "mr_training_enable"

Response *Response Status* **C**

ACCEPT.

Cl **178B** SC **178B.8.3** P **884** L **51** # 337

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

What about the coeff update FSM it's not mentioned until the end of the section. Also the n physial lanes is a leftover from but we don't talk about physical lanes in 178B

SuggestedRemedy

Remove the last paragraph and change first paragraph from:
An interface implements one instance of each of the Training control and the Training frame lock state diagrams, and their associated variables, functions, counters and timers defined in this subclause, independently for each of the n physical lanes.

To:
An interface using E1 format implements one instance of each of the Training control, the Training frame lock and the Coefficient update state diagrams, and their associated variables, functions, counters and timers defined in this subclause, independently for each lane.

An interface using O1 format implements one instance of each of the Training control and the Training frame lock state diagrams, and their associated variables, functions, counters and timers defined in this subclause, independently for each lane.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.8.3.1** *P* **886** *L* **22** # 341

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

local_tf_lock is just one of the conditions for having the status field frame lock bit be set to a 1.

SuggestedRemedy

Remove the last sentence from the definition of local_tf_lock.

Response *Response Status* **W**

ACCEPT.

Cl **178B** *SC* **178B.8.3.1** *P* **887** *L* **17** # 342

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

training is true when runing ILT with training frames, but if you run with local pattern it's false.

SuggestedRemedy

Change "is in progress"
To "is in progress using training frames (see 178B.7.3)."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.8.3.3** *P* **888** *L* **6** # 348

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

The description of how stop timer works should be up where we actually refer to 14.2.3.2.

SuggestedRemedy

Remove "All timers operate as described in 14.2.3.2 with one addition. A timer is reset and stops counting upon entering a state where "stop x_timer" is stated." from 178B.8.3.3 and add "A timer is reset and stops counting upon entering a state where "stop x_timer" is stated." to the end of the first paragraph of 178B.8.1

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.
[Editor's note: changed page/line from 882/25 to 888/6].

Cl **178B** *SC* **178B.8.3.3** *P* **888** *L* **14** # 427

Shrikhande, Kapil — Marvell Technologies

Comment Type **T** *Comment Status* **A** *(B1) (CI)*

max_wait_time_done should be max_wait_timer_done

SuggestedRemedy

Change max_wait_time_done to max_wait_timer_done.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.8.3.5** *P* **888** *L* **38** # 343

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (CI)*

The training control function is for the ILT function not the RTS function.

SuggestedRemedy

change RTS to ILT.

Response *Response Status* **W**

ACCEPT.

Cl **179** *SC* **179.4** *P* **416** *L* **27** # 329

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *psu rts_status (B1) (CI)*

RTS function status is now rts_status

SuggestedRemedy

Change training_status to rts_status

Response *Response Status* **W**

ACCEPT.

Cl **179** *SC* **179.8.1** *P* **418** *L* **13** # 396

Swenson, Norman — Nokia, Point2

Comment Type **ER** *Comment Status* **A** *test points (E)*

As described in Table 179-6, TP1, TP2, TP3, and TP4 are not at the locations shown in Figure 179-2. They are at the input or output of test fixtures that are not shown in the figure. However, the figure does show the corresponding locations in the link, though these locations are not accessible in a real system.

SuggestedRemedy

Change
"The test points are illustrated in Figure 179-2, which shows ..."
to
"The test points are illustrated at their corresponding link locations in Figure 179-2, which shows ..."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The CRG reviewed slides 9-10 of the contribution <https://www.ieee802.org/3/dj/public/25_11/swenson_3dj_01a_2511.pdf>.
Implement the suggested remedy.

Cl **179** *SC* **179.8.2** *P* **419** *L* **39** # 199

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *psu wording other (B1) (CI)*

"PMD control function" is a remnant from older PMD clauses.
Also in 179.8.5, 179.8.7.

SuggestedRemedy

Change "PMD control function" to "ILT function".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy in the three places noted.

Cl **179** *SC* **179.8.9** *P* **421** *L* **7** # 41

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

The Annex 178b name changed

SuggestedRemedy

Change the title of 179.8.9 to: Path startup (PSU) functions

Change: "The PMD shall provide the inter-sublayer link training (ILT) function with E1 format, specified in Annex 178B."
To: "The PMD shall provide the PSU inter-sublayer link training (ILT) function with E1 format, specified in Annex 178B."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179** *SC* **179.9.4** *P* **422** *L* **44** # 143

Healey, Adam — Broadcom, Inc.

Comment Type **TR** *Comment Status* **A** *R_peak (E)*

The linear fit pulse peak ratio specifications should agree with the host reference models that are used to calculate cable assembly channel operating margin (COM). The specifications appear to be placeholders.

SuggestedRemedy

Update the specifications to agree with the Rpeak value calculated for the COM reference model for each host class.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #232.

Cl **179** *SC* **179.9.4** *P* **422** *L* **44** # 360

Rysin, Alexander NVIDIA

Comment Type **TR** *Comment Status* **A** *R_peak (E)*

The current limits for Rpeak seem to be placeholders and in some cases (specifically for HN) are not practical. Data, obtained with an instrument-grade pattern generator and practical channels representing the different host classes was presented in rysin_3dj_01a_2509. The limits are to be revised based on the presented data.

SuggestedRemedy

Change the Rpeak limit for HH from 0.456 to 0.425. Change the Rpeak limit for HN from 0.345 to 0.3.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #232.

Cl **179** *SC* **179.9.4** *P* **422** *L* **44** # 200

Ran, Adee Cisco Systems

Comment Type **TR** *Comment Status* **A** *R_peak (E)*

The R_peak maximum values for each host in Table 179-7 were adopted by comment #303 against D1.3 with the purpose of replacing TBDs with values that seemed reasonable. To tie the transmitter, receiver, and channel specifications together, the transmitter specification values should match the reference transmitter of each host class (part of the COM model). However, no analysis was presented to show how the R_peak specifications correspond to the reference transmitter.

Also for host and module output specifications, Table 176D-2 and Table 176D-3.

SuggestedRemedy

A presentation with analysis and a proposal for R_peak values is planned.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #232.

Cl **179** *SC* **179.9.4** *P* **423** *L* **5** # 78

Brown, Matt Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (E)*

The parameter title "transmitter waveform" is inconsistent with the referenced subclause. Note also that 176D and 176C refer to "transmitter output waveform".

SuggestedRemedy

Change "transmitter waveform" to "transmitter output waveform in Table 179-7 and Table 178-6.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The title of 179.9.4.1, which is the parent of referenced subclauses in both Table 179-7 and Table 178-6, is indeed "Transmitter output waveform", not "transmitter waveform".
In the similar 176D.8.7, the title is "Transmit equalization"
Table 176C-2, the corresponding parameter is "Output waveform".
These titles and references should be corrected and unified.

The content of 179.9.4.1 and its descendants specifies the transmitter equalization capability. The title "Transmitter output equalization" seems more appropriate.

Change the titles of 179.9.4.1 and 176D.8.7 to "Transmitter output equalization".
Change "transmitter waveform" to "Transmitter output equalization" in Table 179-7 and Table 178-6, Table 176D-2, and Table 176D-3.
Change "Output waveform" to "Transmitter output equalization" in In Table 176C-2.
Change "Transmitter output waveform" to "Transmitter output equalization" in Table 176D-2 and Table 176D-3.

Implement with editorial license.

Cl **179** *SC* **179.9.5.4.1** *P* **438** *L* **11** # 22

Brown, Matt Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (E)*

Editor's note has expired.

SuggestedRemedy

Delete editor's note.

Response *Response Status* **C**

ACCEPT.

Cl **179** *SC* **179.9.5.6** *P* **439** *L* **40** # 23

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (E)*

Editor's note has expired.

SuggestedRemedy

Delete editor's note.

Response *Response Status* **C**

ACCEPT.

Cl **179** *SC* **179.11** *P* **441** *L* **9** # 233

Heck, Howard — TE Connectivity

Comment Type **TR** *Comment Status* **R** *Loss budget (E)*

Cable assembly TP1-TP4 insertion loss specifications are proving challenging to meet when accounting for all sources of variation, specifically for the CA-A and CA-B cable assembly classes. A more manufacturable specification needs an additional 1 dB insertion loss to be allocated to the cable assembly for CA-A and CA-B.

SuggestedRemedy

In Table 179A-1 reduce the insertion loss allocation for all three host classes (HL/HN/HH) by 0.5 dB.
Increase the TP1-TP4 cable assembly insertion loss (Table 179-14) for CA-A from 19 dB to 20 dB, and for CA-B from 24 dB to 25 dB.
Change the partial host PCB trace lengths in Table 179-19.
In Table 179-7 change the values for Rpeak and J4u03 to account for the change in host loss.
In Table 179-14 reduce the "Test H (high loss)" min/max test channel insertion loss values by 0.5 dB.
In Table 179-14 change the Test H (high loss) cable assembly insertion loss for Host class HH to 24.5(min)-25.5(max) dB.
A contribution is planned for the November plenary meeting.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179** *SC* **179.11.2** *P* **441** *L* **39** # 303

Kocsis, Sam — Amphenol

Comment Type **T** *Comment Status* **R** *Minimum loss (E)*

The minimum cable assembly insertion loss of 16dB, may exclude working cables from compliance.

SuggestedRemedy

Adjust the minimum cable assembly insertion loss to a value aligned with working cables as demonstrated in contribution. Contribution to follow at the November plenary.

Response *Response Status* **C**

REJECT.
The CRG reviewed slides 4-6 of <https://www.ieee802.org/3/dj/public/25_11/ran_3dj_01a_2511.pdf>.

There was interest in reducing the minimum cable assembly loss, but there were concerns about the details of the proposal and the implications of the change on receiver compliance.

There is no consensus to make the proposed change at this time.

Cl **179** *SC* **179.11.3** *P* **441** *L* **46** # 299

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *test fixtures (E)*

The phrase "discontinuity of the MDI connector" is confusing with more context. More specifically, which side of the MDI connector is the Tfx definition referring to, given the new definition of the MCB in Annex179B.

SuggestedRemedy

Add more descriptive text like "discontinuity of the MCB via at the MDI connector" or "discontinuity of the MDI connector up to reference plan of the TP2 or TP3 (HCB) test fixture". Alternatively additional context could be provided in a separate figure, or notes on Figure 179A-1.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

For consistency with the text in 179B.3.1, change from
"The test fixture delay is defined as the propagation delay between the coaxial connector on the test fixture and the discontinuity of the MDI connector"
to
"The test fixture delay is defined as the propagation delay between the coaxial connector on the test fixture and the first discontinuity of the MDI connector"

Cl **179** *SC* **179.11.6.1** *P* **444** *L* **50** # 204

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *Loss budget (E)*

Comment #357 against D2.1 stated that the loss allocation for the MCB is larger than real MCBs by about 1 dB. Since designing new MCBs with higher loss will increase the measured loss of the cable assembly by 2 dB, this is not desirable.
One of the proposals is to reduce the reference MCB loss by 1 dB.

The NOTE at the top of page 445 reminds us of the relationship between the insertion losses of the reference test fixture, the partial host channel, and the recommended maximum host channel.
In order to keep the host channel allowance the same, if the reference MCB loss is reduced by 1 dB, then the partial host channel loss should be increase by 1 dB to compensate.

The partial host channel parameters were proposed in https://www.ieee802.org/3/dj/public/24_11/ran_3dj_02a_2411.pdf.
The difference between the ILdd at 53.125 GHz of the recommended TP0d-TP2 (Table 179A-1) and the MTF (Figure 179A-1) are:
For HL: 12.75-9.75 = 3 dB
For HN:17.75-9.75 = 8 dB
For HH: 22.75-9.75 = 13 dB
They should be increased to 4, 9, and 14 dB respectively.
For C2M (Table 176D-6) the partial channel loss should be increased from 32-9.75=22.25 dB to 23.25 dB.
The suggested remedy includes parameters that would yield these values.

SuggestedRemedy

Change the values in Table 179-20 as follows:
For HL (Pkg class A): zp(1)=9, zp(h)=27
For HN (Pkg class B): zp(1)=15, zp(h)=82
For HH (Pkg class B): zp(1)=45, zp(h)=95

And in Table 176D-6: zp(1)=45, zp(h)=280.

Reduce the reference MCB and MTF IL at 53.125 to 4.95 and 8.75 dB respectively, across the draft. Scale the equations in Annex 179B as necessary to achieve that change.

Implement with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #232.

Cl **179** *SC* **179.11.6.1** *P* **444** *L* **443** # 300

Kocsis, Sam — Amphenol

Comment Type **T** *Comment Status* **R** *partial host channel (E)*

The reference partial host channels do not explicitly define a minimum Host channel, aligned with the informative reference in 179A.4. The current HL specfication creates the corner cases for the asymetric channel configurations. This highlights a potential issue that may apply to 178 and 176D as well.

SuggestedRemedy

There may be a number of ways to solve this, some of which were presented in rysin_3dj_01a_2509. Additional details and options planned for a contribution to follow at the November plenary.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179** *SC* **179.11.6.1** *P* **445** *L* **2** # 205

Ran, Adee — Cisco Systems

Comment Type **ER** *Comment Status* **A** *(B1) Loss budget (E)*

The NOTE says that the sum <.> including the reference mated test fixtures is equal to the recommended maximum host channel IL in 179A.4. This is incorrect; the host channel as defined in 179A.4 does not include the HCB, so the sum should only include the MCB, not the mated test fixtures.

SuggestedRemedy

Change the note to read:
NOTE-For each host class, the sum of the differential insertion loss (ILdd) at 53.125 GHz of the partial host channel (excluding the device termination) and the reference cable assembly test fixture (see Equation (179B-2) and Figure 179A-1) is equal to the recommended maximum host channel insertion loss in Table 179A-1 for that host class.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The suggested remedy is to replace "reference mated test fixtures" with "reference cable assembly test fixture" and update the references.
Implement the suggested remedy with editorial license.

Cl **179A** *SC* **179A.2** *P* **898** *L* **23** # 398

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **R** *(B1) (E)*

It is a little confusing that the transmitter for Clause 179 PMDs points to characterisitcs for Clause 178 PMDs, unless the point is that the same transmitter characteristics are intended for both PMDs.

SuggestedRemedy

Add a sentence to the beginning of Clause 179A.2:
"The transmitter characteristics for Clause 179 PMDs are intended to match those for Clause 178 PMDs."

Response *Response Status* **W**

REJECT.

The referenced subclause provides explicit transmitter specifications. The more generic sentence proposed may cause more confustion in the future for readers.

Cl **179A** *SC* **179A.3** *P* **898** *L* **29** # 399

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **R** *(B1) (E)*

It is a little confusing that the receiver for Clause 179 PMDs points to characterisitcs for Clause 178 PMDs, unless the point is that the same receiver characteristics are intended for both PMDs.

SuggestedRemedy

Add a sentence to the beginning of Clause 179A.3:
"The receiver characteristics for Clause 179 PMDs are intended to match those for Clause 178 PMDs."

Response *Response Status* **W**

REJECT.
The referenced subclause provides explicit receiver specifications. The more generic sentence proposed may cause more confustion in the future for readers.

Cl **179A** *SC* **179A.4** *P* **898** *L* **42** # 400

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(B1) (E)*

The singular "loss" does not gramatically agree with the verb "are" in the sentence.

SuggestedRemedy

Change
"The recommended maximum differential insertion loss (TP0d-to-TP2) or (TP3-to-TP5d) are consistent with the host channels and the reference TP2 or TP3 test fixture specified in 179B.2.1."
to
The recommended maximum differential insertion loss (TP0d-to-TP2) or (TP3-to-TP5d) is consistent with the host channels and the reference TP2 or TP3 test fixture specified in 179B.2.1.

Response *Response Status* **W**

ACCEPT.

Cl **179A** *SC* **179A.5** *P* **901** *L* **21** # 232

Heck, Howard — TE Connectivity

Comment Type **TR** *Comment Status* **A** *Loss budget (E)*

Comment #140 against D1.4 resulted in a change to Figure 179A-1 that resulted in the loss of the MCB PCB and the via+connector being lumped into a single value. This has the unintended consequence of requiring adjustment to the MCB PCB design to compensate for any difference in via+connector insertion loss from the amount allocated to it prior to D1.5, which can increase the amount of MCB trace loss included in a TP1-TP4 cable assembly measurement.

Specifics: The MTF loss specified in the lower left of Figure 179A-1 specifies values for TP1-TP2 (9.75 dB), the HCB from TP2 to the via+connector (3.8 dB), and the MCB from TP1 (5.95 dB) to the far side of the via+connector (the same point as for the HCB). The MCB loss specification therefore includes PCB, PCB via and the via+connector. Up through D1.4, the MCB loss was specified as PCB only with a value of 2.7 dB, effectively allocating 3.25 dB for the via+connector. Existing MCB designs with which all cable assemblies have been measured were designed to the 2.7 dB trace insertion loss. Hardware measurements are showing 1 dB or more lower loss for the via+connector. Since the MCB loss includes the via+connector, the MCB traces now require 1 dB additional loss to compensate for the lower via+connector loss. This additional MCB loss increases the MCB loss in a TP1-TP4 cable assembly measurement by 2 dB, effectively reducing cable assembly portion of the loss by 2 dB (2 MCBs in a measurement), compromising the ability to meet the existing TP1-TP4 insertion loss specs.

SuggestedRemedy

Change Figure 179A-1: TP1-to-connector 'far side' insertion loss = 4.95 dB, TP1-TP2 insertion loss = 8.75.
In Table 179-14 reduce the "Test H (High Loss)" min/max test channel insertion loss values by 1 dB.
In Table 179A-1 reduce the insertion loss values for Host Channels and for TP0d-TP2/TP3-TP5d by 1 dB.
Change the values for Rpeak and J4u03 in Table 179-7 to account for the change in host loss.
A supporting contribution is planned for the November plenary meeting.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The CRG reviewed the contributions <https://www.ieee802.org/3/dj/public/25_11/heck_3dj_01b_2511.pdf> and <https://www.ieee802.org/3/dj/public/25_11/healey_3dj_01a_2511.pdf>.

Implement the proposed changes in slides 7-11 and 14 of heck_3dj_01b_2511, and the columns labeled "Comment #232 accepted" on slide 14 of healey_3dj_01a_2511, with editorial license.

[Editor's note: CC: 179A, 179, 176D]

====
This comment follows up on comment #357 against D2.1, which was rejected, but the response indicated interest in exploring the direction ("Continued work and consensus building is encouraged").
The suggested remedy does not include values for Rpeak and J4u03, which may also be affected by the resolution of comment #233.
Also, the suggested remedy does not include any changes in Annex 176D, which also uses the MCB and should be affected by the proposed change. For C2M, assuming the TP0d-TP1d is not changed, the partial host channel needs to be increased. Comment #204 suggests the change for that.
It is expected that these details be covered by the referenced presentations for this comment and/or comment #204.

Cl **179B** *SC* **179B.1** *P* **904** *L* **13** # 408

Swenson, Norman — Nokia, Point2

Comment Type **E** *Comment Status* **A** *(B1p) (E)*

This is the normative clause that defines the Cable test fixtures. The test fixtures assume an MDI connector, a PCB board, and a coaxial connector enabling connection to test equipment, but that is not stated anywhere.

SuggestedRemedy

Replace the second paragraph of 179B.1 with the following:
"Cable assembly measurements for the cable assembly types (see Annex 179D) are made between TP1 and TP4 with cable assembly test fixtures at both ends. Each such test fixture has an MDI receptacle compatible with the MDI plug at the end of the cable assembly, a coaxial connector for each lane suitable for connection to test equipment, and a PCB connecting the lanes from the MDI receptacle to the coaxial connectors. The test fixture reference insertion loss is specified in 179B.3. The TP2 or TP3 test fixture and the cable assembly test fixture are specified in a mated state to enable connections to measurement equipment. The reference insertion loss of the mated test fixtures is 9.75 dB at 53.125 GHz using Equation (179B-5)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed slides 10-12 of <https://www.ieee802.org/3/dj/public/25_11/ran_3dj_01a_2511.pdf>.

Implement the suggested change on slide 12 with editorial license.

Cl **179B** *SC* **179B.1** *P* **904** *L* **13** # 407

Swenson, Norman — Nokia, Point2

Comment Type **E** *Comment Status* **A** *(B1p) (E)*

This is the normative clause that defines the TP2 or TP3 test fixtures. The test fixtures assume an MDI connector, a PCB board, and a coaxial connector enabling connection to test equipment, but that is not stated anywhere.

SuggestedRemedy

Replace the first paragraph of 179B.1 with the following:
"Transmitter and receiver measurements at TP2 or TP3 for the 200GBASE-CR1, 400GBASE-CR2, 800GBASE-CR4, and 1.6TBASE-CR8 hosts (see Annex 179D) and at TP1a or TP4a (see Figure 176D-4) for the 200GAUI-1, 400GAUI-2, 800GAUI-4, and 1.6TAUI-8 C2M hosts (see Annex 176D), are made utilizing test fixtures. Each such test fixture has an edge connector plug that is compatible with the MDI receptacle on the host board, a coaxial connector for each lane suitable for connection to test equipment, and a PCB connecting the lanes from the edge connector plug to the coaxial connectors. The test fixture reference insertion loss is specified in 179B.2."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed slides 10-11 of
<https://www.ieee802.org/3/dj/public/25_11/ran_3dj_01a_2511.pdf>.

Implement the suggested change on slide 11 with editorial license.

Cl **179B** *SC* **179B.1** *P* **904** *L* **14** # 140

Healey, Adam — Broadcom, Inc.

Comment Type **E** *Comment Status* **A** *(B1) (E)*

The subclause begins "Transmitter and receiver measurements at TP2 or TP3 for the 200GBASE-CR1, 400GBASE-CR2, 800GBASE-CR4, and 1.6TBASE-CR8 hosts (see Annex 179D).". Annex 179D does not define transmitter and receiver measurements at TP2 or TP3 for hosts so the reference does not seem to be correct.

SuggestedRemedy

Change the reference to 179.8.1.

Response *Response Status* **C**

ACCEPT.

Cl **179B** *SC* **179B.1** *P* **904** *L* **23** # 409

Swenson, Norman — Nokia, Point2

Comment Type **E** *Comment Status* **A** *(B1) (E)*

The equivalence of the Module Compliance Board and the Cable Assembly Test Fixture can be made more clear.

SuggestedRemedy

Replace the second third of 179B.1 with the following:
"Module measurements for modules specified in Annex 176D are made at module compliance points TP1 and TP4 (see Figure 176D-5) with test fixtures known as Module Compliance Boards that are equivalent to Cable Assembly Test Fixtures. Reference insertion loss for each such test fixture is specified in 179B.3."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The commenter indicated an error in the suggested remedy as follows:
In the suggested remedy "Replace the second third of 179B.1." should have been "Replace the third paragraph of 179B.1."

However, in 179B.1 the tem "cable assembly test fixture" is not yet introduced. The equivalency is clear when the term is introduced in 179B.3. The proposed resolution for Comment #408 should satisfy the points of clarity.

Cl **179B** *SC* **179B.2.1** *P* **904** *L* **40** # 141

Healey, Adam — Broadcom, Inc.

Comment Type **T** *Comment Status* **A** *test fixtures (E)*

For the TP2/TP3 test fixture, the reference point is defined to be the "center of the edge connector pad". In 179B.3.1, it is stated that the reference point for the cable assembly test fixture is the "mating point of the MDI connector". There is a note in 179B.4.2 that states the reference insertion loss for the mated test fixture is the sum of the reference insertion losses for the TP2/TP3 test fixture and cable assembly test fixture. This suggests that the "center of the edge connector pad" and the "center of the edge connector pad" are the same reference point. If this is the case, then the same name/description should be used in both instances.

SuggestedRemedy

Call the reference point either "center of the edge connector pad" or "mating point of the MDI connector" consistently in both 179B.2.1 and 179B.3.1. Consider adding a note to Figure 179A-1 to describe the this reference point since the illustrations do not clearly show it.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed slides 8-9 of
<https://www.ieee802.org/3/dj/public/25_11/ran_3dj_01a_2511.pdf>.

Implement the change on slide 9 of ran_3dj_01a_2511.

Cl **179B** SC **179B.2.1** P**904** L**45** # 394

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(B1) (E)*

The subscript on Ildd is inconsistent with that used on line 49.

SuggestedRemedy

Change the subscript "tref" to "tfref".

Response *Response Status* **W**

ACCEPT.

Cl **179B** SC **179B.2.1** P**905** L**3** # 25

Brown, Matt Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (E)*

Editor's note has expired.

SuggestedRemedy

Delete editor's note.

Response *Response Status* **C**

ACCEPT.

Cl **179B** SC **179B.3.1** P**905** L**24** # 167

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *test fixtures (E)*

This is related to the unsatisfied comment #20513 against D2.0. Measuring the cable assembly test fixture loss by itself is difficult as the unterminated connector will behave differently than the mated connector. Having an accurate estimate of this loss is necessary for correcting the cable assembly loss measurements.

SuggestedRemedy

Add the following to the end of the paragraph. "The insertion loss of the actual test fixture is equal to the measured loss of the actual test fixture mated with a TP2 or TP3 test fixture minus the loss of the specific TP2 or TP3 test fixture used in that measurement."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The commenter points out the challenge of measuring a cable assembly test fixture by itself, and provides a way to accurately estimate the loss of the test fixture.

Append to the paragraph
"The cable assembly test fixture reference insertion loss is defined as the insertion loss between the reference plane of the coaxial connector and the mating point of the MDI connector. The reference insertion loss is
defined by Equation (179B-2) and illustrated by Figure 179B-1. The effects of differences between the insertion loss of an actual test fixture and the reference insertion loss are to be accounted for in the measurements."
The following text:
"The insertion loss of the actual test fixture is equal to the measured loss of the actual test fixture mated with a TP2 or TP3 test fixture minus the loss of the specific TP2 or TP3 test fixture used in that measurement."

Implement with editorial license.

Cl **179B** SC **179B.3.1** P**905** L**26** # 395

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(B1) (E)*

The subscript on Ildd is inconsistent with that used on line 29.

SuggestedRemedy

Change the subscript "catref" to "catfref".

Response *Response Status* **W**

ACCEPT.

Cl **179B** *SC* **179B.3.1** *P* **905** *L* **29** # 305

Noujeim, Leesa — Google

Comment Type **TR** *Comment Status* **A** *(B1) (E)*

Cable assembly test fixture should not refer to PCB since the definition now includes everything between the reference plane of the coax connector and the mating point of the MDI connector

SuggestedRemedy

Remove "PCB" in the definition of Ildd_catfref(f)

Response *Response Status* **W**

ACCEPT.

Cl **179B** *SC* **179B.4.2** *P* **905** *L* **20** # 306

Noujeim, Leesa — Google

Comment Type **TR** *Comment Status* **R** *test fixtures (E)*

Ildd_MTFmin is, at fNyquist, 4dB lower than Ildd_MTFmax. This large allowed variation in MTF IL introduces too much uncertainty as to whether a given DUT (host or cable assembly) passes or fails due to variation in the test fixture.

SuggestedRemedy

Decrease the spread between ILddMTFmin and ILddMTFmax to ~2dB, by adjusting equations 179B-3 and 179B-4.

Response *Response Status* **W**

REJECT.
The comment identifies an area for potential improvement in the current draft. However, the suggested remedy does not provide sufficient detail to implement.
A contribution with a detailed proposal would be helpful for the CRG to drive consensus on a specific change.

Cl **179B** *SC* **179B.4.2** *P* **906** *L* **33** # 356

Sakai, Toshiaki — Socionext

Comment Type **T** *Comment Status* **R** *(withdrawn)*

Equation (179B-5) produces negative insertion-loss values for frequencies below approximately 0.2 GHz. Also, Equation (179B-4) produces negative insertion-loss values for frequencies below approximately 0.7 GHz. Since insertion loss physically cannot be < 0 dB for a passive mated test fixture, the requirement "for 0.01 = f = 67 GHz" cannot be satisfied in the sub-GHz range. Moreover, other clauses defining fixture IL (e.g., 178.9.2.1.1) specify 0.05 GHz = f = 67 GHz, suggesting that the intent was to restrict applicability to that range. As written, the text could mislead implementers into interpreting the equation as a hard compliance mask down to 10 MHz, which is non-physical.

This correction eliminates the non-physical negative insertion-loss region below <approximately> 0.2 GHz (179B-5) and <approximately> 0.7 GHz (179B-4) aligns the frequency range with 178.9.2.1.1 (0.05-67 GHz), and clarifies that sub-GHz values from the polynomial fit are extrapolation artifacts, not measurement requirements. It ensures consistency across test-fixture clauses and prevents.

SuggestedRemedy

Option A (preferred): Replace "for 0.01 = f = 67 GHz" with "for 0.05 = f = 67 GHz." Add a Note: Values of ILddMTFmax(f), ILddMTFmin(f) and ILddMTFref(f) below 0 dB are not physically meaningful and shall be treated as 0 dB; such frequencies are not enforced for compliance.

Option B: Keep the existing range but modify the equations by applying a 0 dB floor:
ILddMTFmax'(f) = max(0 dB, ILddMTFmax(f)),
ILddMTFmin'(f) = max(0 dB, ILddMTFmin(f)),
ILddMTFref'(f) = max(0 dB, ILddMTFref(f)).
Add a Note indicating that values below 0 dB are ignored for compliance evaluation.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179B** *SC* **179B.4.2** *P* **906** *L* **46** # 26

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (E)*

Editor's note has expired.

SuggestedRemedy

Delete editor's note.

Response *Response Status* **C**

ACCEPT.

Cl **179B** *SC* **179B.4.3** *P* **908** *L* **6** # 13

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *(B1) (E)*

In Draft 2.1, the reference impedence for mated test fixture measurements was changed to 92.5 Ohms to align with a similar change to the PMD and channel specficaition in Clause 179 and elsewhere. However, a similar change was not applied to the test fixture specificaitions in 179B.2 and 178B.3.

SuggestedRemedy

Add the following text to 179B.1 and remove the similar text in 178B.4.3.
"The reference impedance for differential specifications is 92.5 O. The reference impedance for common-mode specifications is 23.125 O. Renormalization of S-parameter data may be required, see 178A.1.3."

Response *Response Status* **W**

ACCEPT.

Cl **179B** *SC* **179B.4.3** *P* **908** *L* **24** # 301

Kocsis, Sam — Amphenol

Comment Type **T** *Comment Status* **A** *MTF Requirements (E)*

In D2P2, both the s-parameter reference impedance and the ERL reference impeance are now 92.5-ohm differential (46.25-ohm single-ended). The RF connectors used in MTF measurements introduce a significant impact to the computed ERL result, making a limit of 10.3dB very challenging to achieve.

SuggestedRemedy

Change the ERL limit to account for the deltaERL with the RF coax connector, OR allow for a fixed Tfx setting to remove the impact of the RF coax connector. Contribution to follow at the November plenary.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The CRG reviewed the contribution <https://www.ieee802.org/3/dj/public/25_11/kocsis_3dj_01a_2511.pdf>.
The updated proposal in the presentation is to change Tfx for the MTF ERL from 0 to 0.15 ns.

Change Tfx for the MTF ERL from 0 to 0.15 ns, with maximum of 10.3 dB (current value). Add an additional specification for max MTF ERL of 9 dB with Tfx=0, all other parameters unchanged.
Implement with editorial license.

Cl **180** *SC* **180.3** *P* **460** *L* **6** # 330

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *psu rts_status (B1) (CI)*

RTS function status is now rts_status

SuggestedRemedy

Change training_status to rts_status

Response *Response Status* **W**

ACCEPT.

Cl **180** *SC* **180.5.2** *P* **462** *L* **49** # 206

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *psu wording other (B1) (CI)*

"in the ISL training function (see 178B.7 and Figure 178B-6)"
178B.7 is titled "ILT function".

Also in 181.5.2.

SuggestedRemedy

Change to "in the ILT function (see 178B.7 and Figure 178B-6)", in 180.5.2 and 181.5.2.

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.5.12** *P* **464** *L* **31** # 48

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

The Annex 178b name changed. Also the text is different from a similar section 179.8.9

SuggestedRemedy

Change the title of 180.5.12 to: Path startup (PSU) functions

Change: "A PMD shall provide the ILT function for a Type O1 interface, specified in Annex 178B."
To: "The PMD shall provide the PSU inter-sublayer link training (ILT) function with O1 format, specified in Annex 178B."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **180** *SC* **180.5.12** *P* **464** *L* **33** # 410

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *ilt format (B1) (CI)*

O1 is defined as "format" in 178B.7.3.2.
Also in 181.5.12, 182.5.12, 183.5.12.

SuggestedRemedy

Change "for a Type O1 interface" to "with O1 format", with editorial license.
[CC 180, 181, 182, 183]

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license noting that some other comments might overtake this response.

Cl **180** *SC* **180.5.12** *P* **464** *L* **42** # 2

Lusted, Kent — Synopsys

Comment Type **T** *Comment Status* **R** *(withdrawn)*

the default max_wait_timer_duration of 60 seconds is a long time for optical links. The max_wait_timer is not started until TRAIN_START state, in which many other module specific processes such as power on, firmware load/update, initialization, calibration, etc. have already taken place.

SuggestedRemedy

Reduce the duration of the timer for CI 180 and 181 and 182 and 183 to 30 seconds.

Presentation to be provided.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **180** *SC* **180.7.1** *P* **466** *L* **11** # 262

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *CER TDECQ limit (CO)*

TDECQ CER limit of 3.4 dB may need to be increased given that TDECQ CER captures additional impairements. To meet TDECQ CER of 3.4 dB one may need to have TDECQ/TECQ =3.0 dB.

SuggestedRemedy

TDECQ CER may need to raised to 3.8 dB or keep current limit with understanding TDECQ/TECQ have to be =3 dB typically to meet the TDECQ CER. If we raise the TDECQ CER from 3.4 dB and not accouting link budget that is problematic as well.
See ghiasi_3dj_03_2511

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_11/ghiasi_3dj_01a_2511.pdf

Resolve using the response to comment #137.

Cl **180** *SC* **180.7.1** *P* **466** *L* **11** # 263

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *CER TDECQ limit (CO)*

TDECQ CER limit of 3.4 dB may need to be increased given that TDECQ CER captures additional impairements. To meet TDECQ CER of 3.4 dB one may need to have TDECQ/TECQ =3.0 dB.

SuggestedRemedy

TDECQ CER may need to raised to 3.8 dB or keep current limit with understanding TDECQ/TECQ have to be =3 dB typically to meet the TDECQ CER. If we raise the TDECQ CER from 3.4 dB and not accouting link budget that is problematic as well.
See ghiasi_3dj_03_2511

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_11/ghiasi_3dj_01a_2511.pdf

Resolve using the response to comment #137.

Cl **180** *SC* **180.7.1** *P* **466** *L* **11** # 261

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *CER TDECQ limit (CO)*

TDECQ CER limit of 3.4 dB may need to be increased given that TDECQ CER captures additional impairements. To meet TDECQ CER of 3.4 dB one may need to have TDECQ/TECQ =3.0 dB.

SuggestedRemedy

TDECQ CER may need to raised to 3.8 dB or keep current limit with understanding TDECQ/TECQ have to be =3 dB typically to meet the TDECQ CER. If we raise the TDECQ CER from 3.4 dB and not accouting link budget that is problematic as well. See ghiasi_3dj_03_2511

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_11/ghiasi_3dj_01a_2511.pdf

Resolve using the response to comment #137.

Cl **180** *SC* **180.7.1** *P* **466** *L* **11** # 247

Rodes, Roberto — Coherent

Comment Type **TR** *Comment Status* **R** *CER TDECQ (CO)*

The TDECQ CER specification was adopted despite experimental analyses revealing significant consistency issues. A fix from Keysight is expected soon; however, at this point, the specification remains untestable.

SuggestedRemedy

Remove the TDECQ CER from the spec

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #137.

Cl **180** *SC* **180.7.1** *P* **466** *L* **15** # 252

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *overshoot (O)*

In D2.0 1T DFE was added to the TDECQ equalizer which reduces the need for transmiteer overshoot where TDECQ doesn't capture peak-to-average ratio and may result in BER degradation with improving TDECQ.

SuggestedRemedy

Reduce transmitter overshoot from 22% to 12% and
see ghiasi_3dj_01_2511 as also suggested by unsatisfied comment 162

Response *Response Status* **W**

REJECT.

This is a returning comment from D2.1, comment #162, which was resolved with the following response.
"REJECT.
The following presentation was reviewed
https://www.ieee802.org/3/dj/public/25_09/ghiasi_3dj_01a_2509.pdf
The comment does not provide sufficient justification to support the suggested remedy. Further data is encouraged to bring to the task force for consideration."

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_11/ghiasi_3dj_03a_2511.pdf.

No consensus to make a change at this time.

Cl **180** *SC* **180.7.1** *P* **466** *L* **15** # 223

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **R** *overshoot (O)*

D2.1 comment 162: overshoot limit should be reduced. Notice that according to 140.7.7, 1% of the signal is allowed to be above the upper limit and another 1% below. Compare this with P=1e7 for electrical signals (176D.8.2), which recognises that rare excursions could defeat the FEC, although 1e-7 is impractical for an optical measurement without addressing the measurement noise.

SuggestedRemedy

Reduce the overshoot limit. Tighten the 1% to 0.3% as in 167.8.8 (100G/lane MMF).

Response *Response Status* **W**

REJECT.

The comment does not provide sufficient justification to support the suggested remedy, in particular the proposed new hit ratio of 0.3%.

Note: the suggested remedy mentions overshoot limit but is assumed the commentor was referring to the hit ratio. This is related to the response to comment #252.

Cl **180** *SC* **180.7.1** *P* **466** *L* **32** # 160

Johnson, John — Broadcom

Comment Type **TR** *Comment Status* **A** *jitter (CO)*

Requirements for optical TX jitter testing were adopted during Sept. CRG with weak consensus. The supporting presentation (ran_3dj_04_0925) did show using a 100G TX that TECQ is not very sensitive to RJ or low levels of SJ. However, it did not demonstrate that the measurement was sufficiently sensitive at 200G, did not provide sufficient evidence the need for Jrms and EOJ03, did not show that the proposed spec limits were in the right place (the 100G example would fail J4u03) or that the existing TX functional symbol error histogram (TFSEH) test was insufficient to screen out TX with high jitter (the 100G example showed good FEC bin correlation with increasing jitter).

SuggestedRemedy

Remove the output jitter specs from Table 180-7, and remove the output jitter test description in 180.9.15. Make corresponding changes in clauses 181, 182 and 183.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #139.

Cl **180** *SC* **180.7.1** *P* **466** *L* **33** # 256

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *jitter (CO)*

In D2.1 optical output jitter was added and was initially considered during IEEE meeting in Hmaburg, see https://www.ieee802.org/3/dj/public/24_09/ghiasi_3dj_01a_2409.pdf. The contribution showed that jitter is already captured by TDECQ unless one has band-limited low frequency RJ where only occasionally some of the KP4 frame affected. Average measuremnt will not identify this bad transmiter even measuing EOJ, JRMS, and J4u. Block TDECQ was one option but due to need for real time scope, stake holders defined Transmitter Functional test, which was somehting Marco Mazzini used to determine bad transmitters. It is not clear what additional value jitter provides and current jitter limits are too restricated.

SuggestedRemedy

Some of the issue with pre-D2.0 TDECQ were:
- Transmitter with higher TDECQ had better BER than one with lower TDECQ with more overshoot
- Now we have DFE and there is no reason to have 22% overshoot and assuming we do the wise thing the issue of excessive overshoot is addressed
- The one remaining issure was low frequency RJ that affect some of the KP4 frame where any average measurment will miss it but to address this issue we added Transmitter Functional test.

So what specific issue are we solving by adding jitter?
see ghiasi_3dj_02_2511

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #139.

Cl **180** *SC* **180.7.1** *P* **466** *L* **34** # 207

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **R** *jitter limit (CO)*

The limit value of J4u03 is based on the suggested remedy of comment #399 against D2.1 (values from 176D.8.9 except that J4u03 is increased by 10%), resulting in 0.130 UI. However, the data provided to support the comment (see https://www.ieee802.org/3/dj/public/25_09/ran_3dj_04_2509.pdf#page=7) showed that the measured J4u03 is significantly larger than what is expected from the injected SJ, and the larger J4u03 can still be tolerated. With 12 MHz SJ, the receiver performance was acceptable (extrapolated FLR below the maximum allowed by Ethernet) even with measured J4u03 of 0.244; the next lower measured value 0.228 showed several orders of magnitude lower FLR.

It is known that J4u and EOJ03 are sensitive to measurement noise, and it is likely that this noise is larger in optical test setups. JRMS as currently defined should not be as sensitive.

In order to reduce the chance that good enough transmitters will fail the test, it is proposed to relax the J4u03 and EOJ03 limit from 130 mUI to 230 mUI (increase by about 77%) and correspondingly relax EOJ03 from 25 mUI to 44 mUI.

Similar relaxations should be applied in all IM-DD PMD clauses (which currently have somewhat different limits for J4u03) and the maximum values (in UI) should be the same, unless decided otherwise by other comments.

SuggestedRemedy

In Table 180-7, change the maximum value of J4u03 from 0.130 to 0.23, and the maximum EOJ03 from 0.025 to 0.044, both in UI units.
Use the same values in Table 181-5, Table 182-7, and Table 183-6.

[CC 180, 181, 182, 183]

Response *Response Status* **C**

REJECT.

Per comment #139, the jitter subclause was deleted so this comment was overtaken by events.

Cl **180** *SC* **180.9.1** *P* **473** *L* **18** # 4

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **R** *jitter test pattern (CO)*

New jitter specifications require PRBS9Q and refers to 176.7.4.4 for the specification of this pattern. However, this subclauses points out that this pattern is only relevant to PMDs defined in clauses 178 and 179. On the other hand, there are two other suitable patterns defined so alternately consider removing the PRBS9Q pattern for these PMDs.

SuggestedRemedy

In 176.4.4 change "PMD defined in Clause 178 or Clause 179" to "PMD defined in Clause 178 through Clause 181"
Alternately, delete PRBS9Q for optical TX testing. Similarly update Clause 181.
Affects clauses 180, 181, and 176.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **180** *SC* **180.9.5** *P* **475** *L* **2** # 211

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *OMA_outer (O)*

The text says "OMAouter is measured using the waveforms captured at the output of the reference receiver defined in 180.9.2". That means that the reference equalizer is not applied.
Figure 180-8 is supposed to illustrate runs of 7 threes and 6 zeros, but before the reference equalizer these runs will not be flat and will have significantly different levels compared to other symbols - contrary to what is shown in the figure. So the figure does not match the definition.

Ideally OMAouter would be measured after a long enough run such that any ISI will die out. But with the far ISI implied by the length of the reference receiver, the test patterns do not include such runs. If the signal is not stable at the measurement point then the OMAouter could be reduced and made dependent on the pattern or test setup. That would not match the assumed meaning of this parameter.

Since the reference equalizer is defined to have unity gain at DC, it is expected to preserve the asymptotic value of a long run, and to equalize the signal such that shorter runs will also reach the same value. Therefore, measuring after the reference receiver would provide a less ISI-dependent result that corresponds to long runs, which is arguably what OMAouter is expected to represent. It would also make Figure 180-8 representative of the measurement specification.

Note that this argument holds for the signal but not for the noise. The noise levels (N0 and N3, used for RINxxOMA) would be amplified by the reference equalizer. Whether the noise should be measured with or without the reference receiver is a separate question.

SuggestedRemedy

Change the quoted sentence to "OMAouter is measured using the waveforms captured at the output of the reference equalizer defined in 180.9.6.3".

Response *Response Status* **W**

REJECT.

Both OMAouter and RINxxOMA are implemented in test equipment and have been used by the optical industry for near a decade. Updating the definition brings major change to the field practice, therefore needs strong evidence proving the current method is failing. However, the current comment doesn't provide sufficient justification.

Further, disconnecting the reference point of OMA and RINxxOMA can be confusing.

The commenter is encouraged to bring more evidence on this topic.

Cl **180** *SC* **180.9.6** *P* **475** *L* **29** # 162

Johnson, John — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (O)*

It's unnecessary to define how the reference receiver may be implemented, since that is already done in 180.9.2.

SuggestedRemedy

Replace:
"The reference receiver and reference equalizer may be implemented in software or may be part of an oscilloscope."
with:
"The reference equalizer may be implemented in software or may be part of an oscilloscope."
with editorial license.

Response *Response Status* **W**

ACCEPT.

Cl **180** *SC* **180.9.6.1** *P* **475** *L* **48** # 265

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *TDECQ mission mode (CO)*

TDECQ mission mode test definition should be made more clear, see also unsatisfied comment 144

SuggestedRemedy

Propsoed text
TDECQ is defined with all receive xAUI-n lanes when instantiated in operation using test pattern 3 or 5 (see Table 180-13). xAUI-n lanes operate with receiver jitter tolerance condition defined by applicable instantiated xAUI-n.
The received test patterns shall be asynchronous to the pattern used to test the transmitter, and shall
have power levels as specified in Table 180-8 for the aggressor lanes in the stressed receiver
sensitivity test.

Response *Response Status* **W**

REJECT.

This comment is a restatement of comment #144 against D2.1 as recorded in the following report:
https://www.ieee802.org/3/dj/comments/D2p1/8023dj_D2p1_comments_final_id.pdf

The response to that comment was:

" REJECT.
There was not sufficient consensus to adopt the proposed changes.
Straw poll TF-4 (directional) I support adopting the suggested remedy with or without some caveats for clauses 180 through 183.
Yes: 10 No: 11 NMI: 3 Abstain: 13."

However, during discussion it was revealed that there is some agreement that changes in the direction of the suggested remedy should be considered.

However, a complete solution defining the intended test configuration and conditions is required.

Cl **180** *SC* **180.9.6.1** *P* **476** *L* **10** # 161

Johnson, John — Broadcom

Comment Type **TR** *Comment Status* **A** *TDECQ (B1) (O)*

The diagram in Figure 180-9 shows a single block for "Reference equalizer and analysis" which are unrelated functions. The reference equalizer is a separate entity defined in 180.9.6.3. Although the reference equalizer is iteratively optimized in the TDECQ analysis, it should be treated as separate from it.

SuggestedRemedy

Break the "Reference equalizer and analysis" block in Figure 180-9 into two separate blocks, one for "Reference equalizer" and one for "Analysis".

Response *Response Status* **W**

ACCEPT.

Cl **180** *SC* **180.9.6.3** *P* **477** *L* **2** # 136

Nowell, Mark — Cisco

Comment Type **TR** *Comment Status* **R** *TDECQ, DFE (CO)*

Submitting this comment on behalf of the Task Force.

The 200G SMF IMDD clauses currently include four separate transmitter quality metric test criteria which is likely more than is required to provide specification criteria that guarantees interoperability.

Currently there has been insufficient supporting evidence to justify the need to include all of the tests as a requirement in order to stay in the specification in order to guarantee interoperability. Without enough supporting evidence being contributed to the Task Force, it is proposed to remove each test due to lack of support or validity of effectiveness.

SuggestedRemedy

Remove the changes to the TDECQ methodology which include the addition of the DFE equalizer to the reference receiver.

See resolution to comment #384 of D2.0 comments to identify the changes that were made and remove. Within subclause 180.9.6.3 remove references to the DFE equalizer in the reference equalizer and remove any associated references or parameters. Apply the equivalent changes to clauses 181, 182 and 183.

A background presentation will be provided.

Response *Response Status* **W**

REJECT.

The following contribution was reviewed at the 802.3dj joint ad hoc meeting on 2025/11/30.
https://www.ieee802.org/3/dj/public/adhoc/electrical/25_1030/nowell_3dj_adhoc_01a_251030.pdf

The commenter clarified that the intent of this comment was to provide a comment for each of the paths discussed in nowell_3dj_adhoc_01a_251030 and not as a position of the task force.

Based on straw poll TF-2 there is strong consensus to leave the TDECQ specification in the draft.

There is no consensus to adopt the suggested remedy.

TF-2 (directional)
I support the continued inclusion of the currently defined TDECQ test/specification (with or without refinements) in the P802.3dj draft
Yes: 49
No: 2
Need more information: 9

Cl **180** *SC* **180.9.6.4** *P* **478** *L* **53** # 164

Johnson, John — Broadcom

Comment Type **TR** *Comment Status* **A** *TDECQ (B1) (O)*

Now that the Reference equalizer is not just FFE, update the text to replace references to "FFE equalizer" with "Reference equalizer".

SuggestedRemedy

Replace:
"The TDECQ reference point where OMA_TDECQ is referenced to and noise is added is at the input of the FFE equalizer."
with:
"The TDECQ reference point where OMA_TDECQ is referenced to and noise is added is at the input of the Reference equalizer."
with editorial license.

Response *Response Status* **W**

ACCEPT.

Cl **180** *SC* **180.9.6.4** *P* **478** *L* **54** # 316

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **T** *Comment Status* **A** *TDECQ (O)*

The OMA in the subsection of TDECQ method is used to claculat the P_thi, I = 1,2,3 in Equation 180-1,-2,-3. P_thi is then used to calculated the propability of the histogram captured from the equalized eye diagram. Figure 180-11 showed the relation between P_thi and OMA. For the instances of OMA in 180.9.6.4, they should be consistent. P_thi is determined based on the equalized eye, therefore the associated OMA should be based on the equalized eye. To differentiate this OMA from the OMA_outer in the Tx spec, which is based on the non-equalized eye.

SuggestedRemedy

change instances of OMA_outer in Figure 180-11, Equation 180-1, 180-2, 180-12 to OMA_TDECQ, add a sentence that OMA_TDECQ is calculated based on the method described in 180.9.5 except the reference point is after the reference equalizer.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy and update Figure 180-11, equation 180-1, 180-3, 180-12 and 180-25 and the associated text changing OMA_outer to OMA_TDECQ.

Implement with editorial license.

Cl **180** *SC* **180.9.6.4** *P* **479** *L* **3** # 24

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *editor's note (B1) (O)*

Editor's note has expired.

SuggestedRemedy

Delete editor's note.

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.6.4** *P* **479** *L* **3** # 294

Maki, Jeffery — Juniper Networks

Comment Type **E** *Comment Status* **A** *editor's note (B1) (O)*

Editor's note: "outer FEC" is used with outer as an adjective except many workers think outer is part of compound noun since Inner FEC is defined as a compound noun (term).

SuggestedRemedy

Clarify the use of outer. Is Outer FEC a defined compound noun (term) or not?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The editor's note on page 479 line 3 does not include the term "outer FEC". The word "outer" here refers to OMA_outer, which is the optical modulation amplitude of the outer eye for a PAM4 signal.
As noted with the editor's note, the editor's note will be deleted in Draft 2.3 regardless.

Cl **180** *SC* **180.9.6.4** *P* **480** *L* # 227

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **R** *TDECQ, DFE (CO)*

Pulse shape of DFE feedback signal

SuggestedRemedy

Needs to be slowed down to make TDECQ respond consistently to jitter

Response *Response Status* **W**

REJECT.
The suggested remedy does not provide sufficient detail to implement.

Cl **180** *SC* **180.9.6.4** *P* **480** *L* **23** # 212

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *TDECQ (O) (B1)*

SER is an overloaded acronym; in most contexts it is used as FEC symbol error ratio, but for TDECQ it is defined (earlier in this subclause) as "PAM4 symbol error ratio".
Additional uses of this acronym should also use "PAM4".
A maintenance request to apply a similar change in Clause 121 is planned.

SuggestedRemedy

Change "the partial SER" to "the partial PAM4 SER".
Change "the three partial SERs is the SER" to "the three partial PAM4 SER values is the PAM4 SER".
Change "target SER" to "target PAM4 SER".
Change "consistent with the BER and target symbol error ratio for Gray coded PAM4" to "Consistent with the target PAM4 SER and Gray coded PAM4".

Apply in all instances of the above.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **180** *SC* **180.9.6.4** *P* **482** *L* **3** # 163

Johnson, John — Broadcom

Comment Type **TR** *Comment Status* **A** *TDECQ (B1) (O)*

The definition of Q_t is incomplete. It isn't stated in the text that it is the Q-factor of the sub-eyes at the target SER, and there is an undefined reference to "the BER" that isn't needed. 180.9.7 contains a more complete definition and a formula for Q_t that can be referenced.

SuggestedRemedy

Replace:
"Q_t is 3.428, consistent with the BER and target symbol error ratio for Gray coded PAM4."
with:
"Qt is 3.428, consistent with the target symbol error ratio for Grey coded PAM4, and can be calculated according to Equation (180-26)."
with editorial license.

Response *Response Status* **W**

ACCEPT.

Cl **180** *SC* **180.9.7** *P* **482** *L* **10** # 137

Nowell, Mark — Cisco

Comment Type **TR** *Comment Status* **R** *CER TDECQ (CO)*

Submitting this comment on behalf of the Task Force.

The 200G SMF IMDD clauses currently include four separate transmitter quality metric test criteria which is likely more than is required to provide specification criteria that guarantees interoperability.

Currently there has been insufficient supporting evidence to justify the need to include all of the tests as a requirement in order to stay in the specification in order to guarantee interoperability. Without enough supporting evidence being contributed to the Task Force, it is proposed to remove each test due to lack of support or validity of effectiveness.

SuggestedRemedy

Remove the changes made due to the adoption of the TDECQ_CER methodology into D2.2

See resolution to comment #179 of D2.1 comments to identify the changes and remove. Delete subclause 180.9.7 and associated references. Apply the equivalent changes to clauses 181, 182 and 183.

A background presentation will be provided.

Response *Response Status* **W**

REJECT.

The following contribution was reviewed at the 802.3dj joint ad hoc meeting on 2025/11/30.
https://www.ieee802.org/3/dj/public/adhoc/electrical/25_1030/nowell_3dj_adhoc_01a_251030.pdf

The commenter clarified that the intent of this comment was to provide a comment for each of the paths discussed in nowell_3dj_adhoc_01a_251030 and not as a position of the task force.

Based on straw poll #TF-6 there no consensus adopt the suggested remedy.

There is no consensus to adopt the suggested remedy.

Straw poll TF-3 (directional)
I support the continued inclusion of the currently defined TDECQ_CER test/specification (with or without refinements) in the P802.3dj draft
Yes: 22
No: 23
Need more information: 17

Straw poll TF-6 (decision)
I support adopting the suggested remedy for comment #137 (remove TDECQ_CER).
Yes: 21
No: 45
Need more information: 8

Cl **180** *SC* **180.9.7.1** *P* **482** *L* **44** # 117

El-Chayeb, Ahmad — Keysight (ahmad.el-chayeb@keysight.com)

Comment Type **TR** *Comment Status* **A** *CER TDECQ (CO)*

The number of samples/UI required for the waveform acquisition is not defined.

SuggestedRemedy

Add the text below at the end of the first sentence is sub-clause 180.9.7.1:

The waveform should be acquired with greater than 25 samples/UI, for the histogram width of 0.04 UI, to guarantee at least one sample falls within both the left and right histogram for each symbol.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_11/chayeb_3dj_01a_2511.pdf

Add the text below at the end of the first sentence in subclause 180.9.7.1:
"The waveform should be acquired with greater than 25 samples/UI. This provides at least one sample falling within both the left and the right 0.04 UI width histograms for each symbol."

Implement with editorial license.

Cl **180** *SC* **180.9.7.1** *P* **483** *L* **9** # 118

El-Chayeb, Ahmad — Keysight (ahmad.el-chayeb@keysight.com)

Comment Type **TR** *Comment Status* **A** *CER TDECQ (CO)*

The definition for the probability of error for each symbol Ln is not clear.

SuggestedRemedy

Change the text on lines 9-25 to:

The probability of error for each symbol Ln is calculated by first taking all the samples points within the limits of the target histogram of the nth symbol. The amplitude of the M samples are y(n,i).

The probability that the nth symbol is in error, can be calculated as:

Perr,n (s)= 1/M S Pn,i (s)

where,

Pn,i (s) = ...

Exact formula for Pn,i (s) will be provided in a supporting presentation.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_11/chayeb_3dj_01a_2511.pdf

Implement the "suggested remedy" on slide 11 of chayeb_3dj_01a_2511.

Implement with editorial license.

Cl **180** *SC* **180.9.7.1** *P* **483** *L* **23** # 84

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *CER TDECQ (B1) (CO)*

In equation 180-15, for the bottom subequation, Ln should be 3, not 0.

SuggestedRemedy

Change "0" to "3".

Response *Response Status* **W**

ACCEPT.

Cl **180** *SC* **180.9.7.1** *P* **483** *L* **24** # 308

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **T** *Comment Status* **A** *CER TDECQ (B1) (CO)*

The last condition in equation 180-15 should be Ln = 3

SuggestedRemedy

Change Ln = 0 to Ln = 3

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.7.1** *P* **483** *L* **42** # 12

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *CER TDECQ (B1) (CO)*

The acronym PMF is never defined. Perhaps this is intended to be "probability mass function"?

SuggestedRemedy

Change "PMF" to "probability mass function (PMF)".

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.7.1** *P* **483** *L* **46** # 313

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **E** *Comment Status* **A** *CER TDECQ (B1) (CO)*

In Equation (180-18), for e = 0, P_{FEC,n}s should be P_{FEC,n}(s).

SuggestedRemedy

Change P_{FEC,n}s to P_{FEC,n}(s).

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.7.1** *P* **484** *L* **22** # 83

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *CER TDECQ (B1) (CO)*

Based on the calculation of target CER in equation 180-22 the assumption is the target SER is random (independent and identically distributed). This assumption should be noted in the discussion preceding equation 180-22.

SuggestedRemedy

On page 484 line 23 append the following sentence to the paragraph: "The target PAM4 symbol error ratio assumes that the errors independent and identically distributed."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Change to "The target PAM4 symbol error ratio assumes that the errors are independent and identically distributed."

Cl **180** *SC* **180.9.7.1** *P* **484** *L* **26** # 314

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **T** *Comment Status* **A** *CER TDECQ (B1) (CO)*

When assuming i FEC symbol errors in a codeword, the probability should be nchoosek(d,i)p^i(1-p)^{d-i}.

SuggestedRemedy

Change (1-p)^{k-i} to (1-p)^{d-i} in Equation (180-22).

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.7.1** *P* **484** *L* **26** # 311

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **T** *Comment Status* **A** *CER TDECQ (B1) (CO)*

An FEC symbol consists of m PAM4 symbols. The probability of an FEC symbol error p should be 1-(1-SER_target)^m instead of SER^m_target.

SuggestedRemedy

Change SER^m_targe to 1-(1-SER_target)^m.

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.9** *P* **465** *L* **20** # 266

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *Tx FRx (CO)*

Unless xAUI-n interface operate with condition of jitter tolerance Functional reciver will not catch anything, see also unsatisfied comment 145

SuggestedRemedy

Add: AUI lanes operate with receiver jitter tolerance condition defined by applicable instantiated xAUI-n.

Response *Response Status* **W**

REJECT.

This comment is a restatement of comment #145 against D2.1 as recorded in the following report:
https://www.ieee802.org/3/dj/comments/D2p1/8023dj_D2p1_comments_final_id.pdf

The response to that comment was:
" ACCEPT IN PRINCIPLE.
Resolve using the response to comment #510."

The resolution to comment #510 is to Implement slides 4, 6, 8, 9, 10, 12, 13, 15, 16, 18 and 19 of issenhuth_01a_2509.pdf. Where in these quoted slides, jitter tolerance condition was excluded for the xAUI-n interface of the transmitter under test.

However, during discussion it was revealed that there is some agreement that changes in the direction of the suggested remedy should be considered.

However, a complete solution defining the intended test configuration and conditions is required.

Cl **180** *SC* **180.9.9** *P* **465** *L* **25** # 268

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *Tx FRx (CO)*

Unless xAUI-n interface operate with condition of jitter tolerance Functional reciver will not catch anything, see also unsatisfied comment 147

SuggestedRemedy

Add: AUI lanes operate with receiver jitter tolerance condition defined by applicable instantiated xAUI-n.

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #266.

Cl **180** *SC* **180.9.9** *P* **485** *L* **7** # 271

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *Tx FRx (O)*

Section 180.9.9 defines error histogram then section 180.9.9.1 defines functional receiver FRx definition, actually it doesn't define but rather defines the condition for FRx test

SuggestedRemedy

Propsoed modification:
Move 180.9.9 to 180.9.9.1
Move 180.9.9.1 to 180.9.9.2
Change the name of 180.9.9.2 to Functional receiver (FRx) test condition
In 180.9.9 define what is a functional receiver -
Functional receiver is an optical receiver with a PMA that meets or exceed receiver sensitivity condition in table 180-8 and is capable of symbol error reporting.
Move 3rd paragraph in 180.9.9 "For thoes cases ..." in the new section 180.9.9 with definition of FRx.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #194.

Cl **180** *SC* **180.9.9** *P* **485** *L* **7** # 278

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *Tx FRx (CO)*

Transmitter functional test wihout ILT may not produce reliable result as the adaptation may vary and the receiver wouldn't be able to request pre-coding.

SuggestedRemedy

Add follwing in section 180.9.9 -
Transmitter Functional receiver
configures the DUT transmitter precoding to the settings it would select
using the ILT protocol (see 178B). The settings may be communicated via the ILT protocol or by other
means.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Add following in subclause 180.9.9:
The transmitter under test is configured with precoding set appropriately for the functional receiver being used in the test. The appropriate precoding state may be communicated via the ILT function or by other means.

Implement with editorial license.

Cl **180** *SC* **180.9.9** *P* **485** *L* **8** # 138

Nowell, Mark — Cisco

Comment Type **TR** *Comment Status* **R** *Tx FRx (CO)*

Submitting this comment on behalf of the Task Force.

The 200G SMF IMDD clauses currently include four separate transmitter quality metric test criteria which is likely more than is required to provide specification criteria that guarantees interoperability.

Currently there has been insufficient supporting evidence to justify the need to include all of the tests as a requirement in order to stay in the specification in order to guarantee interoperability. Without enough supporting evidence being contributed to the Task Force, it is proposed to remove each test due to lack of support or validity of effectiveness.

SuggestedRemedy

Remove the changes made due to the adoption of the TFSEM methodology into D2.1 and modifications into D2.2.

See resolution to comment #392 of D2.0 comments to identify the changes and remove.
See resolution to comment # 510 of D2.1 comments to identify the changes and remove.

Delete subclause 180.9.9 and associated references. Apply the equivalent changes to clauses 181, 182 and 183.

A background presentation will be provided.

Response *Response Status* **W**

REJECT.

The following contribution was reviewed at the 802.3dj joint ad hoc meeting on 2025/11/30.
https://www.ieee802.org/3/dj/public/adhoc/electrical/25_1030/nowell_3dj_adhoc_01a_251030.pdf

The commenter clarified that the intent of this comment was to provide a comment for each of the paths discussed in nowell_3dj_adhoc_01a_251030 and not as a position of the task force.

Based on straw poll TF-4 there appears to be no consensus to adopt the suggested remedy.

There is no consensus to adopt the suggested remedy.

Straw poll TF-4 (directional)
I support the continued inclusion of the currently defined TFSEM (Transmitter functional symbol error histogram) test/specification (with or without refinements) in the P802.3dj draft
Yes: 37
No: 14
Need more information: 12

Straw poll TF-7 (decision)
I support adopting the suggested remedy for comment #138 (remove transmitter functional symbol error histogram test/specification).
Yes: 29
No: 49

Cl **180** *SC* **180.9.9** *P* **485** *L* **14** # 85

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *Tx FRx (B1) (O)*

Reference to "n symbol errors" should be "n test symbol errors".

SuggestedRemedy

Change "n symbol errors" to "n test symbol errors"

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.9** *P* **485** *L* **15** # 72

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *Tx FRx (O)*

The description of the error mask is provided twice. Once in the paragraph on page 485 line 15 and in the footnotes of Table 180-18 on page 486 line 1. The descriptions are inconsistent with each other. Since the table itself is definitive , the description in the paragraph can be deleted. The two footnotes need not be separate. Footnote a contradicts footnote b for bins for k in the range 9 to 16. Since the paragraph relates the BER to the Test_Margin variable the full context should be provided in the paragraph and the footnotes deleted.

SuggestedRemedy

Replace the following sentence "The error mask, calculated based on 174A.9.5 using BER = 2.4 × 10-5 and p = 1, is listed in Table 180-18."
With "The error mask is provided in Table 180-18. The limit Hmax(k) for k in the range 1 to 8 is calculated based on 174A.9.5 using BER = 2.4x10^-5 and p = 1. The limit Hmax(k) for k in the range 1 to 8 is is are set to H_max(16) calculated based on 174A.9.5 using BER = 2.28x10^-4 and p = 1."
In Table 180-18 delete footnotes a and b.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

In the second paragraph of 180.9.9 replace the sentence
"The error mask, calculated based on 174A.9.5 using BER = 2.4 × 10-5 and p = 1, is listed in Table 180-18."

With

"The error mask is provided in Table 180-18. The limit Hmax(k) for k in the range 1 to 8 is calculated based on 174A.9.5 using BER = 2.4x10^-5 and p = 1. The limit Hmax(k) for k in the range 9 to 16 is set to Hmax(16) calculated based on 174A.9.5 using BER = 2.28x10^-4 and p = 1."

In Table 180-18 delete footnotes a and b.

With editorial license.

Cl **180** *SC* **180.9.9** *P* **485** *L* **41** # 225

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *Tx FRx (O)*

The FEC bin limits have been revised to address impossible test times, but still they are very far from consistent with the project objective "BER of better than or equal to 10^-13 at the MAC/PLS service interface (or the frame loss ratio
equivalent)". If the FEC bin curve has half the theoretical gradient, bin 9 at 3.5e-13 might correspond to bin 16 at 1e-27, which is less than the age of the universe but (if my quick calculation is right) corersponds to a bad FEC block every 100 years on a million-link network - far beyond the lifetime of the equipment.

SuggestedRemedy

Rescale the x axis so that the last bin limit >3.5e-13 is bin 11, giving a BER equivalent substantially better than OIF's 1e-15 target.
Consider tightening the 1e-13 objective.

Response *Response Status* **W**

REJECT.

The comment does not provide sufficient justification to support the suggested remedy.

This comment is related to comment #155.

There is no consensus to make a change at this time.

Cl **180** *SC* **180.9.9** *P* **485** *L* **43** # 155

Maniloff, Eric Ciena

Comment Type **TR** *Comment Status* **R** *Tx FRx (O)*

For symbol errors = 9 Table 180-18 specifies flat counts, consistent with a pre FEC BER ~2.3E-4. This implies that a transmitter could have a large error floor and still pass the test. It would be preferable to specify the actual probabilities consistent with a value of ~1e-26 or include no values with an informative note indicating these bins should have no measured occurances.

SuggestedRemedy

Update the values in Table 180-18 for symbol errors > 9 to remove the flat mask.

Response *Response Status* **W**

REJECT.

In comment resolution of D2.1, the block error mask was discussed and agreed in the CRG, without overly tightening the Tx spec, to avoid screening out working Transmitters.

The comment does not provide sufficient justification to support the suggested remedy.

There is no consensus to make a change at this time.

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **12** # 230

Dawe, Piers Nvidia

Comment Type **ER** *Comment Status* **R** *Tx FRx (O)*

This section is quite involved with no introduction of what it is trying to do. It puts far too much burden on the reader's patience and reverse engineering skills.

SuggestedRemedy

Explain what the intention is. Show the various items adding and subtracting in a diagram.

Response *Response Status* **W**

REJECT.

The suggested remedy does not provide sufficient detail to implement.

Future work to develop a diagram to address the concern is encouraged.

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **12** # 228

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *Tx FRx (O)*

It seems that VOA_level is derived from 9 powers or power-ratios, of which 7 are measured or estimated. As the headline margin is 1.5 dB, there are too many measurement errors.

SuggestedRemedy

This needs to be greatly simplified.

Response *Response Status* **W**

REJECT.

The suggested remedy does not provide sufficient detail to implement.

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **16** # 192

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *Tx FRx (O)*

Tx_DUT_power_budget given in equation 180-28 when added to RxS_OMA@TECQ = 0 does not give Tx_DUT_OMA(min) when max(DUT_TDECQ, DUT_TECQ) is less than 0.9dB.

SuggestedRemedy

Change "added to RxS_OMA@TECQ = 0 gives Tx_DUT_OMA(min) in Table 180-7 and is given by Equation (180-28)" to "is given by Equation (180-28) and when added to RxS_OMA@TECQ = 0 gives Tx_DUT_OMA(min) in Table 180-7 for max(DUT_TDECQ, DUT_TECQ) >=0.9dB." Make the equivalent change in 181.9.9, 182.9.9, and 183.9 .9 (note for 183.9.9 it is "for max(DUT_TDECQ, DUT_TECQ) >=0.9dB for 800GBASE-FR4 and >=1.4dB for 800GBASE-LR4) .

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #194.

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **41** # 193

Dudek, Mike — Marvell

Comment Type **ER** *Comment Status* **R** *Tx FRx (O)*

It would be helpful to provide some guidance as to how to estimate the Test_SMF_ DUT_CD penalty

SuggestedRemedy

Add an Informative Note. "Note:- If the test SMF has the dispersion characteristics of the optical channel used to measure TDECQ then Test_SMF_DUT_CD is equal to DUT_TDECQ-DUT_TECQ.

Response *Response Status* **W**

REJECT.

After CRG discussion it was agreed there are many ways to describe how to do the estimate and listing examples is not helpful. There is no consensus from making a change at this time.

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **42** # 229

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *Tx FRx (O)*

"Test_SMF_power_budget loss and penalty are zero": what is this? Is Test_SMF_power_budget a loss and penalty? Is Test_SMF_power_budget loss zero; if so why is there an equation for it?

SuggestedRemedy

Delete

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #194.

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **42** # 191

Dudek, Mike — Marvell

Comment Type **ER** *Comment Status* **A** *Tx FRx (O)*

It is strange to include the "Test_SMF_power_budget loss and penalty are zero" as part of the definitions (under the "where" heading)

SuggestedRemedy

Make this statement as a separate statement. Either delete it at line 42 add it at line 10 changing "The transmitter under test is connected to the FRx by a short test SMF, or patch cord." to "The transmitter under test is connected to the FRx by a short test SMF, or patch cord and therefore the Test_SMF_power_budget is zero. "
Or delete it at line 42 and add it as a separate paragraph at line 50.
Having made this change the sentences "where in Equation (180-29)- Test_SMF_power_budget, loss and penalty are non-zero." should be deleted from 181.9.9, 182.9.9 and 183.9.9.
See also an alternative solution requiring more editorial changes with moving most of the content from 180.9.9.1 into Clause 181 in a separate comment.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #194.

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **48** # 317

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **T** *Comment Status* **A** *Tx FRx (O)*

TECQ = 0 dB and is given in Table 180-8(-4.3dBm). The " is given in Table 180-8" is misleading, and can be intepreted as RxS_OMA@TECQ=0 is given in 180-8.

SuggestedRemedy

is extrapolating the receiver sensitivity OMA for TECQ >= 0.9 dB, as given in Table 180-8, down to
TECQ = 0 dB.

Apply similar changes to CL 181~183.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #194.

Cl **180** *SC* **180.9.14** *P* **488** *L* **2** # 213

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

Following up on comment #401 (unsatisfied) against D2.1.

As noted in comment #401, Equation 180-31 includes a log of a quantity that is not a pure number - it has a dimension of 1/Hz, or time (since B in the denominator is in Hz).
The equation does not state the dimensions of RINxxOMA, but in Table 180-7 it is specified as dB/Hz, and this matches the previous definition of this parameter, in 52.9.6.3, it is stated as dB/Hz (Equation 52-1). However, the expression there also includes log of a quantity with time dimensions. In order to have the stated dimension of dB/Hz, the bandwidth should have been outside of the equation (i.e., "10*log(Pn/Pm) / BW") such that multiplying by the BW would result in a value in dB..

To demonstrate the problem, multiplying the spec value of -139 dB/Hz (Table 180-7) by the reference receiver bandwidth of 53.125 GHz (180.9.2) yields an absurd result of -7.4e12 dB.

The source of this error seems to be that physically RIN is frequency-dependent and thus accurate characterization should be of its spectral density. But the measurement for this specification is the integrated noise, not the density. The bandwidth inside the log causes the specs to change with signaling rate for similar PHY types (e.g. -139 dB/Hz in Clause 180, -136 dB/Hz in clause 124, -132 dB/Hz in clause 121 - all are DR4 using PAM4 with the same performance metrics).

Ideally the equation should be changed to eliminate the bandwidth completely (yielding a result be in dB). Alternatively the bandwidth could be outside of the log (yielding a result in dB/Hz). Both of these changes would make more sense than the current definition but would require completely different spec values.

Assuming that changes to the spec limits are not desired, it is suggested to change the equation and the units of RINxxOMA in the transmitter specification table, while keeping the numerical maximum values the same.

Assuming the CRG agrees that a change should be made, I intend to take the required action to propagate it to other clauses via maintenance.

As an alternate remedy, the RINxxOMA specification can be deleted, based on no data having been presented to show its importance with respect to other transmitter specifications.

SuggestedRemedy

Change equation 180-31 to yield a value in dB, as follows::
RINxxOMA = 20*log10((N3+N0)/OMA_outer) - 10*log10(B/1 Hz) [dB]
In the definition of B, delete "(Hz)".

In Table 180-7, Table 181-5, Table 182-7, and Table 183-6, change the RINxxOMA units from dB/Hz to dB.

[CC 180, 181, 182, 183]

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **180** *SC* **180.9.14** *P* **488** *L* **12** # 214

Ran, Adee Cisco Systems

Comment Type **T** *Comment Status* **A** *RINxxOMA (O)*

Following up on comment #402 against D2.1.
The comment was resolved by stating that B is the noise bandwidth of the reference receiver. However, the reference receiver in 180.9.2 is defined in terms of its 3 dB bandwidth, not its noise bandwidth. These are not the same and readers might not be aware of the difference.

Moreover, finding the noise bandwidth of a specific filter may be error prone, as definitions vary.

For a 4th-order Bessel filter, the ratio of noise bandwidth to the 3 dB bandwidth is approximately 1.04. This value can be found, for example, from Table I in "Noise Bandwidth of Common Filters", Shelton et al., IEEE Transactions on Communication Technology, December 1970 (https://ieeexplore.ieee.org/document/1090431). The value in the table is 2.08 but the footnote indicates that "B_N is two-sided" so the ratio should be halved.

SuggestedRemedy

Add the following informative NOTE after the variable list of Equation 180-31:
NOTE---The noise bandwidth of a 4th-order Bessel-Thomson filter is 1.04 times its 3 dB bandwidth.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add the following informative NOTE after the variable list of Equation 180-31:
NOTE---The noise bandwidth of a 4th-order Bessel-Thomson filter is approximately 1.04 times its 3 dB bandwidth.

Cl **180** *SC* **180.9.15** *P* **488** *L* **17** # 139

Nowell, Mark Cisco

Comment Type **TR** *Comment Status* **A** *jitter (CO)*

Submitting this comment on behalf of the Task Force.

The 200G SMF IMDD clauses currently include four separate transmitter quality metric test criteria which is likely more than is required to provide specification criteria that guarantees interoperability.

Currently there has been insufficient supporting evidence to justify the need to include all of the tests as a requirement in order to stay in the specification in order to guarantee interoperability. Without enough supporting evidence being contributed to the Task Force, it is proposed to remove each test due to lack of support or validity of effectiveness.

SuggestedRemedy

Remove the changes made due to the adoption of the jitter test methodology for the optical IMDD specs methodology into D2.2

See resolution to comment #399 of D2.1 comments to identify the changes and remove.

Delete subclause 180.9.15 and associated references. Apply the equivalent changes to clauses 181, 182 and 183.

A background presentation will be provided.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed at the 802.3dj joint ad hoc meeting on 2025/11/30.
https://www.ieee802.org/3/dj/public/adhoc/electrical/25_1030/nowell_3dj_adhoc_01a_251030.pdf

The commenter clarified that the intent of this comment was to provide a comment for each of the paths discussed in nowell_3dj_adhoc_01a_251030 and not as a position of the task force.

Based on straw poll TF-5 and TF-8 there is consensus to adopt the suggested remedy.

Implement the suggested remedy with editorial license.

Straw poll TF-5 (directional)
I support the continued inclusion of the currently defined transmitter output jitter test/specification (with or without refinements) in the P802.3dj draft
Yes: 14
No: 36
Need more information: 14

Straw poll TF-8 (decision)

I support adopting the suggested remedy for comment #139 (remove transmitter output jitter test/specification).
Yes: 49
No: 24

Cl **180** *SC* **180.9.15** *P* **488** *L* **17** # 224

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *jitter (CO)*

T(D)ECQ and T(D)ECQ_CER provide holistic measures of a signal's penalty and integrity, including jitter. A separate jitter measurement is an unnecessary diagnostic. The method in 179.9.4.6 is known to not work for J4u. Even if it did, fixed limits for jitter metrics are not appropriate because the margin for jitter depends on other things about the signal.

SuggestedRemedy

Remove this section and the output jitter table entries for all optical clauses

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #139.

Cl **180** *SC* **180.9.15** *P* **488** *L* **20** # 185

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *est pattern reference (B1) (O)*

The test pattern table 180-13 is a list of all the possible test patterns. The correct reference is table 180-14 which lists which test pattern should be used for each test including output jitter.

SuggestedRemedy

Change the reference from 180-13 to 180-14.

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.15** *P* **488** *L* **21** # 17

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *jitter (B1) (O)*

The first expection is a bit misleading. "The equalizer setting is fixed for all of the jitter parameters." No transmitter equalizer settings are defined for the PMDs defined in clauses 180 through 183. Perhaps it would be better to just point that out.

SuggestedRemedy

Replace "The equalizer setting is fixed for all of the jitter parameters."
With "No equalizer settings are defined for the optical transmitter."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy in 180.9.15, 181.9.15, 182.9.15 andd 183.9.15.

Cl **180** *SC* **180.9.16** *P* **488** *L* **42** # 98

Galan, Jose — MaxLinear, Inc.

Comment Type **TR** *Comment Status* **R** *Rx Sensitivity (O)*

The error mask when measuring receiver sensitivity of a complete PHY at the PCS is not defined

SuggestedRemedy

Add the mask required for measuring receiver sensitivity of a complete PHY at the PCS

Response *Response Status* **W**

REJECT.

When using the PCS method, the metric is the codeword error ratio and the error mask is not required.

Cl **180A** *SC* **180A.3.2** *P* **933** *L* **36** # 168

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *(B1) (O)*

The angled end facet is not an "exception" so it shouldn't be part of the "but"

SuggestedRemedy

Delete "an angled end face" i.e Change from "depicted in Figure 180A-1, but with an angled end facet, 16 fibers, an offset keyway, and different pin diameters and locations." to "depicted in Figure 180A-1, but with 16 fibers, an offset keyway, and different pin diameters and locations."

Response *Response Status* **C**

ACCEPT.

Cl **180A** *SC* **180A.3.2** *P* **936** *L* **1** # 169

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *(B1) (O)*

These are single 8-lane PMDs

SuggestedRemedy

Change "4-lane" to 8-lane"

Response *Response Status* **C**

ACCEPT.

Cl **181** *SC* **181.3** *P* **501** *L* **2** # 331

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *psu rts_status (B1) (CI)*

RTS function status is now rts_status

SuggestedRemedy

Change training_status to rts_status

Response *Response Status* **W**

ACCEPT.

Cl **181** *SC* **181.5.12** *P* **504** *L* **23** # 65

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

The Annex 178b name changed. Also the text is different from a similar section 179.8.9

SuggestedRemedy

Change the title of 181.5.12 to: Path startup (PSU) functions

Change: "A PMD shall provide the ILT function for a Type O1 interface, specified in Annex 178B."
To: "The PMD shall provide the PSU inter-sublayer link training (ILT) function with O1 format, specified in Annex 178B."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **181** *SC* **181.7.1** *P* **506** *L* **24** # 253

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *overshoot (O)*

In D2.0 1T DFE was added to the TDECQ equalizer which reduces the need for transmiteer overshoot where TDECQ doesn't capture peak-to-average ratio and may result in BER degradation with improving TDECQ.

SuggestedRemedy

Reduce transmitter overshoot from 22% to 12% and
see ghiasi_3dj_01_2511 as also suggested by unsatisfied comment 163

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #252.

Cl **181** *SC* **181.7.1** *P* **506** *L* **28** # 264

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *CER TDECQ limit (CO)*

TDECQ CER limit of 3.4 dB may need to be increased given that TDECQ CER captures additional impairements. To meet TDECQ CER of 3.4 dB one may need to have TDECQ/TECQ =3.0 dB.

SuggestedRemedy

TDECQ CER may need to raised to 3.8 dB or keep current limit with understanding TDECQ/TECQ have to be =3 dB typically to meet the TDECQ CER. If we raise the TDECQ CER from 3.4 dB and not accouting link budget that is problematic as well.
See ghiasi_3dj_03_2511

Response *Response Status* **W**

REJECT.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_11/ghiasi_3dj_01a_2511.pdf

There is insufficient evidence to change the limit to a different number. Further analysis and consensus building is encouraged.

Cl **181** *SC* **181.7.1** *P* **506** *L* **28** # 248

Rodes, Roberto — Coherent

Comment Type **TR** *Comment Status* **R** *CER TDECQ (CO)*

The TDECQ CER specification was adopted despite experimental analyses revealing significant consistency issues. A fix from Keysight is expected soon; however, at this point, the specification remains untestable.

SuggestedRemedy

Remove the TDECQ CER from the spec

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #137.

Cl **181** *SC* **181.7.1** *P* **506** *L* **44** # 257

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *jitter (CO)*

In D2.1 optical output jitter was added and was initially considered during IEEE meeting in Hmaburg, see https://www.ieee802.org/3/dj/public/24_09/ghiasi_3dj_01a_2409.pdf. The contribution showed that jitter is already captured by TDECQ unless one has band-limited low frequency RJ where only occasionally some of the KP4 frame affected. Average measuremnt will not identify this bad transmiter even measuing EOJ, JRMS, and J4u. Block TDECQ was one option but due to need for real time scope, stake holders defined Transmitter Functional test, which was somehting Marco Mazzini used to determine bad transmitters. It is not clear what additional value jitter provides and current jitter limits are too restricated.

SuggestedRemedy

Some of the issue with pre-D2.0 TDECQ were:
- Transmitter with higher TDECQ had better BER than one with lower TDECQ with more overshoot
- Now we have DFE and there is no reason to have 22% overshoot and assuming we do the wise thing the issue of excessive overshoot is addressed
- The one remaining issure was low frequency RJ that affect some of the KP4 frame where any average measurment will miss it but to address this issue we added Transmitter Functional test.

So what specific issue are we solving by adding jitter?
see ghiasi_3dj_02_2511

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #139.

Cl **181** *SC* **181.9.6** *P* **514** *L* **50** # 267

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **ER** *Comment Status* **R** *TDECQ mission mode (CO)*

TDECQ mission mode test definition should be made more clear, see also unsatisfied comment 146

SuggestedRemedy

Propsoed text
TDECQ is defined with all receive xAUI-n lanes when instantiated in operation using test pattern 3 or 5 (see Table 180-13). xAUI-n lanes operate with receiver jitter tolerance condition defined by applicable instantiated xAUI-n.
The received test patterns shall be asynchronous to the pattern used to test the transmitter, and shall
have power levels as specified in Table 180-8 for the aggressor lanes in the stressed receiver
sensitivity test.

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #265.

Cl **181** *SC* **181.9.9** *P* **516** *L* **1** # 272

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *Tx FRx (O)*

Section 181.9.9 Transmitter functional symbol error histogram that should move into 181.9.9.1

SuggestedRemedy

Propsoed modification:
Make 181.9.9 Functional Receiver
Add the following to section 181.9.9 - "Functional receiver is an optical receiver with a PMA that meets or exceed receiver sensitivity condition in table 181-8 and is capable of symbol error reporting."
and Move 3rd paragraph in 180.9.9 into the same section "For thoes cases ..."
Move the current content of 181.9.9 into 181.9.9.1

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #194.

Cl **181** *SC* **181.9.9** *P* **516** *L* **2** # 279

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *Tx FRx (CO)*

Transmitter functional test wihout ILT may not produce reliable result as the adaptation may vary and the receiver wouldn't be able to request pre-coding.

SuggestedRemedy

Add follwing in section 181.9.9 -
Transmitter Functional receiver
configures the DUT transmitter precoding to the settings it would select using the ILT protocol (see 178B). The settings may be communicated via the ILT protocol or by other
means.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #278.

Cl **181** *SC* **181.9.15** *P* **517** *L* **32** # 186

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *est pattern reference (B1) (O)*

Table 181-13 is Transmitter compliance channel specifications. The correct reference is table 181-12 which lists which test pattern should be used for each test including output jitter.

SuggestedRemedy

Change the reference from 181-13 to 181-12.

Response *Response Status* **C**

ACCEPT.

Cl **181** *SC* **181.9.16** *P* **518** *L* **1** # 215

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **A** *(B1) (CK)*

"with parameters provided in Table 180-19"
Table 180-19 is specific to clause 180 - it includes the PMD types defined therein and the value of p for each one. Clause 181 has one PMD type and it is different, apparently only with p=4.

The same reference appears also in 181.9.17 (same clause).

SuggestedRemedy

Add a specific table for clause 181 instead of referring to Table 180-19.

Make any necessary resulting changes in the text, with editorial license.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
CL181 shares the same set of error ratio parameters as CL180. No new information is provided by adding a new table in Clause 180. But it should be clarified in CL 181 that only p = 4 is used in the clause.
Change: "The error mask Hmax(k) to be used in the method of 174A.9.5 is provided in Table 180-20."
To: "The error mask Hmax(k) to be used in the method of 174A.9.5 is provided in Table 180-20 in the column for p = 4."
Implement with editorial license.

Cl **181** *SC* **181.9.16** *P* **518** *L* **3** # 100

Galan, Jose — MaxLinear, Inc.

Comment Type **TR** *Comment Status* **R** *Rx Sensitivity (O)*

The error mask when measuring receiver sensitivity of a complete PHY at the PCS is not defined

SuggestedRemedy

Add the mask required for measuring receiver sensitivity of a complete PHY at the PCS

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #98.

Cl **182** *SC* **182.1** *P* **528** *L* **24** # 245

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **TR** *Comment Status* **A** *(B1) (O)*

A x00G AUI-n can only be implemented in a x00GBASE-DRn-PHY above the Inner FEC. Note D in Tables 182-1/2/3/4 points to 176B.6.1, However upon reviewing 176B.4.1, 176B.5.1, 176B.6.1, 176B.7.1, it is unclear how this text denotes that an AUI can only be above the Inner FEC sublayer.

SuggestedRemedy

Figure 176B-2 is the clearest indication that an AUI can onlly be above the inner FEC sublayer. A reference to this figure should be added to Note D for Tables Tables 182-1/2/3/4.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The reference to 176B.4.1, 176B.5.1, 176B.6.1, 176B.7.1 should be sufficient however it is noted that each of these subclauses incorrectly points to Figure 176B-1 rather than the correct diagram Figure 176B-2.
In 176B.4.1, 176B.5.1, 176B.6.1, 176B.7.1 change the reference to Figure 176B-1 to Figure 176B-2.

Cl **182** *SC* **182.3** *P* **531** *L* **14** # 332

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *psu rts_status (B1) (CI)*

RTS function status is now rts_status

SuggestedRemedy

Change training_status to rts_status

Response *Response Status* **W**

ACCEPT.

Cl **182** *SC* **182.5.2** *P* **534** *L* **9** # 216

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *psu wording other (B1) (CI)*

"PMD control function" is a remnant from older PMD clauses.

SuggestedRemedy

Change "PMD control function" to "ILT function".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In review it was noticed that D2.1 comment #435 was not implemented in 182.5.2.
Implement suggested remedy and update 182.5.2 to ensure consistent language in 180 through 183.
Implement with editorial license.

Cl **182** *SC* **182.5.12** *P* **535** *L* **44** # 70

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

The Annex 178b name changed. Also the text is different from a similar section 179.8.9

SuggestedRemedy

Change the title of 182.5.12 to: Path startup (PSU) functions

Change: "A PMD shall provide the ILT function for a Type O1 interface, specified in Annex 178B."
To: "The PMD shall provide the PSU inter-sublayer link training (ILT) function with O1 format, specified in Annex 178B."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **182** *SC* **182.5.13** *P* **566** *L* **31** # 52

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

The Annex 178b name changed. Also the text is different from a similar section 179.8.9

SuggestedRemedy

Change the title of 183.5.12 to: Path startup (PSU) functions

Change: "A PMD shall provide the ILT function for a Type O1 interface, specified in Annex 178B."
To: "The PMD shall provide the PSU inter-sublayer link training (ILT) function with O1 format, specified in Annex 178B."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **182** *SC* **182.7.1** *P* **537** *L* **32** # 249

Rodes, Roberto — Coherent

Comment Type **TR** *Comment Status* **R** *CER TDECQ (CO)*

The TDECQ CER specification was adopted despite experimental analyses revealing significant consistency issues. A fix from Keysight is expected soon; however, at this point, the specification remains untestable. In addition, no guidance has been presented or adopted for PMDs incorporating inner FEC.

SuggestedRemedy

Remove the TDECQ CER from the spec

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #137.

Cl **182** *SC* **182.7.1** *P* **537** *L* **36** # 254

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *overshoot (O)*

In D2.0 1T DFE was added to the TDECQ equalizer which reduces the need for transmiteer overshoot where TDECQ doesn't capture peak-to-average ratio and may result in BER degradation with improving TDECQ.

SuggestedRemedy

Reduce transmitter overshoot from 22% to 12% and
see ghiasi_3dj_01_2511 as also suggested by unsatisfied comment 163

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #252.

Cl **182** *SC* **182.7.1** *P* **538** *L* **18** # 258

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *jitter (CO)*

In D2.1 optical output jitter was added and was initially considered during IEEE meeting in Hmaburg, see https://www.ieee802.org/3/dj/public/24_09/ghiasi_3dj_01a_2409.pdf. The contribution showed that jitter is already captured by TDECQ unless one has band-limited low frequency RJ where only occasionally some of the KP4 frame affected. Average measuremnt will not identify this bad transmiter even measuing EOJ, JRMS, and J4u. Block TDECQ was one option but due to need for real time scope, stake holders defined Transmitter Functional test, which was somehting Marco Mazzini used to determine bad transmitters. It is not clear what additional value jitter provides and current jitter limits are too restricated.

SuggestedRemedy

Some of the issue with pre-D2.0 TDECQ were:
- Transmitter with higher TDECQ had better BER than one with lower TDECQ with more overshoot
- Now we have DFE and there is no reason to have 22% overshoot and assuming we do the wise thing the issue of excessive overshoot is addressed
- The one remaining issure was low frequency RJ that affect some of the KP4 frame where any average measurment will miss it but to address this issue we added Transmitter Functional test.

So what specific issue are we solving by adding jitter?
see ghiasi_3dj_02_2511

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #139.

Cl **182** *SC* **182.9.1** *P* **544** *L* **37** # 5

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **R** *jitter test pattern (CO)*

New jitter specifications require PRBS9Q and refers to 176.7.4.4 for the specification of this pattern. However, the PRBS9Q pattern would be provided by the Clause 177 Inner FEC. This pattern is not defined in Clause 177.
On the other hand, there are two other suitable patterns defined so alternately consider removing the PRBS9Q pattern for these PMDs.

SuggestedRemedy

In 177.6.1 add specification for mandatory PRBS9Q test pattern generator using 176.7.4.4 for a template. Add PRBS9Q to Figure 177-2 along with PRBS13Q, etc. In Table 182-13 change the reference to the new subclause in 177.
Alternately, delete PRBS9Q for optical TX testing.
Affects clauses 182, 183, and 177.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **182** *SC* **182.9.6** *P* **546** *L* **38** # 269

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *TDECQ mission mode (CO)*

TDECQ mission mode test definition should be made more clear, see also unsatisfied comment 148

SuggestedRemedy

Propsoed text
TDECQ is defined with all receive xAUI-n lanes when instantiated in operation using test pattern 3 or 5 (see Table 180-13). xAUI-n lanes operate with receiver jitter tolerance condition defined by applicable instantiated xAUI-n.
The received test patterns shall be asynchronous to the pattern used to test the transmitter, and shall
have power levels as specified in Table 180-8 for the aggressor lanes in the stressed receiver
sensitivity test.

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #265.

Cl **182** *SC* **182.9.7** *P* **547** *L* **48** # 295

Maki, Jeffery — Juniper Networks

Comment Type **E** *Comment Status* **A** *editor's note (B1) (O)*

Editor's note: "outer FEC" is used with outer as an adjective except many workers think outer is part of compound noun since Inner FEC is defined as a compound noun (term).

SuggestedRemedy

Clarify the use of outer. Is Outer FEC a defined compound noun (term) or not?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #294.

Cl **182** *SC* **182.9.9** *P* **546** *L* **7** # 273

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *Tx FRx (O)*

Section 182.9.9 Transmitter functional symbol error histogram that should move into 182.9.9.1

SuggestedRemedy

Propsoed modification:
Make 182.9.9 Functional Receiver
Add the following to section 182.9.9 - "Functional receiver is an optical receiver with a PMA that meets or exceed receiver sensitivity condition in table 182-8 and is capable of symbol error reporting."
and Move 3rd paragraph in 182.9.9 into the same section "For thoes cases ..."
Move the current content of 182.9.9 into 182.9.9.1

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #194.

Cl **182** *SC* **182.9.9** *P* **548** *L* **8** # 280

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *Tx FRx (CO)*

Transmitter functional test wihout ILT may not produce reliable result as the adaptation may vary and the receiver wouldn't be able to request pre-coding.

SuggestedRemedy

Add follwing in section 182.9.9 -
Transmitter Functional receiver
configures the DUT transmitter precoding to the settings it would select
using the ILT protocol (see 178B). The settings may be communicated via the ILT protocol or by other
means.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #278.

Cl **182** *SC* **182.9.16** *P* **550** *L* **5** # 101

Galan, Jose — MaxLinear, Inc.

Comment Type **TR** *Comment Status* **R** *Rx Sensitivity (O)*

The error mask when measuring receiver sensitivity of a complete PHY at the PCS is not defined

SuggestedRemedy

Add the mask required for measuring receiver sensitivity of a complete PHY at the PCS

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #98.

Cl **182** *SC* **182.9.17** *P* **550** *L* **44** # 184

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *(B1) (O)*

The reference to 182.9.13.1 is not a hot link and is incorrect.

SuggestedRemedy

Change it from 182.9.13.1 to 182.9.17.1 and make it a hot link

Response *Response Status* **C**

ACCEPT.

Cl **183** *SC* **183.3** *P* **563** *L* **8** # 333

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *psu rts_status (B1) (CI)*

RTS function status is now rts_status

SuggestedRemedy

Change training_status to rts_status

Response *Response Status* **W**

ACCEPT.

Cl **183** *SC* **183.5.2** *P* **564** *L* **9** # 217

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **A** *psu wording other (B1) (CI)*

"PMD control function" is a remnant from older PMD clauses.

SuggestedRemedy

Change "PMD control function" to "ILT function".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In review it was noticed that D2.1 comment #435 was not implemented in 183.5.2.
Implement suggested remedy and update 183.5.2 to ensure consistent language in 180 through 183.
Implement with editorial license.

Cl **183** *SC* **183.7.1** *P* **568** *L* **41** # 250

Rodes, Roberto — Coherent

Comment Type **TR** *Comment Status* **R** *CER TDECQ (CO)*

The TDECQ CER specification was adopted despite experimental analyses revealing significant consistency issues. A fix from Keysight is expected soon; however, at this point, the specification remains untestable. In addition, no guidance has been presented or adopted for PMDs incorporating inner FEC.

SuggestedRemedy

Remove the TDECQ CER from the spec

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #137.

Cl **183** *SC* **183.7.1** *P* **569** *L* **8** # 255

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *overshoot (O)*

In D2.0 1T DFE was added to the TDECQ equalizer which reduces the need for transmiteer overshoot where TDECQ doesn't capture peak-to-average ratio and may result in BER degradation with improving TDECQ.

SuggestedRemedy

Reduce transmitter overshoot from 22% to 12% and
see ghiasi_3dj_01_2511 as also suggested by unsatisfied comment 163

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #252.

Cl **183** *SC* **183.7.1** *P* **569** *L* **22** # 259

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *jitter (CO)*

In D2.1 optical output jitter was added and was initially considered during IEEE meeting in Hmaburg, see https://www.ieee802.org/3/dj/public/24_09/ghiasi_3dj_01a_2409.pdf. The contribution showed that jitter is already captured by TDECQ unless one has band-limited low frequency RJ where only occasionally some of the KP4 frame affected. Average measuremnt will not identify this bad transmiter even measuing EOJ, JRMS, and J4u. Block TDECQ was one option but due to need for real time scope, stake holders defined Transmitter Functional test, which was somehting Marco Mazzini used to determine bad transmitters. It is not clear what additional value jitter provides and current jitter limits are too restricated.

SuggestedRemedy

Some of the issue with pre-D2.0 TDECQ were:
- Transmitter with higher TDECQ had better BER than one with lower TDECQ with more overshoot
- Now we have DFE and there is no reason to have 22% overshoot and assuming we do the wise thing the issue of excessive overshoot is addressed
- The one remaining issure was low frequency RJ that affect some of the KP4 frame where any average measurment will miss it but to address this issue we added Transmitter Functional test.

So what specific issue are we solving by adding jitter?
see ghiasi_3dj_02_2511

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #139.

Cl **183** *SC* **183.9.5** *P* **462** *L* **8** # 275

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *TDECQ mission mode (CO)*

TDECQ mission mode test definition should be made more clear

SuggestedRemedy

Propsoed text
TDECQ is defined with all receive xAUI-n lanes when instantiated in operation using test pattern 3 or 5 (see Table 180-13). xAUI-n lanes operate with receiver jitter tolerance condition defined by applicable instantiated xAUI-n.
The received test patterns shall be asynchronous to the pattern used to test the transmitter, and shall
have power levels as specified in Table 180-8 for the aggressor lanes in the stressed receiver
sensitivity test.

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #265.

Cl **183** *SC* **183.9.6** *P* **579** *L* **46** # 270

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *TDECQ mission mode (CO)*

TDECQ mission mode test definition should be made more clear, see also unsatisfied comment 144

SuggestedRemedy

Propsoed text
TDECQ is defined with all receive xAUI-n lanes when instantiated in operation using test pattern 3 or 5 (see Table 180-13). xAUI-n lanes operate with receiver jitter tolerance condition defined by applicable instantiated xAUI-n.
The received test patterns shall be asynchronous to the pattern used to test the transmitter, and shall
have power levels as specified in Table 180-8 for the aggressor lanes in the stressed receiver
sensitivity test.

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #265.

Cl **183** *SC* **183.9.7** *P* **580** *L* **50** # 296

Maki, Jeffery — Juniper Networks

Comment Type **E** *Comment Status* **A** *editor's note (B1) (O)*

Editor's note: "outer FEC" is used with outer as an adjective except many workers think outer is part of compound noun since Inner FEC is defined as a compound noun (term).

SuggestedRemedy

Clarify the use of outer. Is Outer FEC a defined compound noun (term) or not?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #294.

Cl **183** *SC* **183.9.9** *P* **581** *L* **10** # 274

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *Tx FRx (O)*

Section 183.9.9 Transmitter functional symbol error histogram that should move into 183.9.9.1

SuggestedRemedy

Propsoed modification:
Make 183.9.9 Functional Receiver
Add the following to section 183.9.9 - "Functional receiver is an optical receiver with a PMA that meets or exceed receiver sensitivity condition in table 183-8 and is capable of symbol error reporting."
and Move 3rd paragraph in 183.9.9 into the same section "For thoes cases ..."
Move the current content of 183.9.9 into 183.9.9.1

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #194.f

Cl **183** *SC* **183.9.9** *P* **581** *L* **10** # 281

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *Tx FRx (CO)*

Transmitter functional test wihout ILT may not produce reliable result as the adaptation may vary and the receiver wouldn't be able to request pre-coding.

SuggestedRemedy

Add follwing in section 183.9.9 -
Transmitter Functional receiver
configures the DUT transmitter precoding to the settings it would select
using the ILT protocol (see 178B). The settings may be communicated via the ILT protocol or by other
means.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #278.

Cl **183** *SC* **183.9.16** *P* **583** *L* **16** # 218

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **A** *(B1) (O)*

"with parameters provided in Table 182-16"
Table 182-16 is specific to clause 182 - it includes the PMD types defined therein and the value of p for each one. Clause 183 has one PMD type and it is different, apparently only with p=4.

The same reference appears also in 183.9.17 (same clause).

SuggestedRemedy

Add a specific table for clause 183 instead of referring to Table 182-16.

Make any necessary resulting changes in the text, with editorial license.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #215

Cl **184** *SC* **184.1.3** *P* **592** *L* **50** # 297

Maki, Jeffery — Juniper Networks

Comment Type **E** *Comment Status* **A** *(B1) (L)*

"outer RS-FEC" is used with outer as an adjective except many workers think outer is part of compound noun since Inner FEC is defined as a compound noun (term).

SuggestedRemedy

Clarify the use of outer. Is Outer FEC a defined compound noun (term) or not?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Delete the word "outer" in 184.1.3 on line 50 of page 592.

Cl **184** *SC* **184.4.5** *P* **598** *L* **37** # 298

Maki, Jeffery — Juniper Networks

Comment Type **E** *Comment Status* **A** *(B1) (L)*

"outer RS(544,514) FEC" is used with outer as an adjective except many workers think outer is part of compound noun since Inner FEC is defined as a compound noun (term).

SuggestedRemedy

Clarify the use of outer. Is Outer FEC a defined compound noun (term) or not?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Delete the word "outer" in the first sentence of 184.4.5 on line 37 of page 598.

Cl **184** *SC* **184.7.2.2** *P* **608** *L* **7** # 365

Opsasnick, Eugene — Broadcom

Comment Type **E** *Comment Status* **A** *Deskew (L)*

Update the definition of alignment_status to follow the guidelines adopted during D2.1 comment resolution.

SuggestedRemedy

Another comment suggests removing this variable and the deskew state diagram. If it is not removed, then change the definition of variable alignment_status
From:
"A Boolean variable set by the deskew process to reflect the status of the X polarization symbol stream to Y polarization symbol stream alignment. Set to true when the polarization symbol streams are synchronized and aligned and set to false otherwise."
To:
"A Boolean variable that indicates when the X polarization symbol stream and Y polarization symbol stream are synchronized and aligned. The value of alignment_status is set by the Deskew state diagram (see Figure 184-10)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #366.

Cl **184** *SC* **184.7.2.2** *P* **608** *L* **28** # 368

Opsasnick, Eugene — Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

Update the definition of dsp_ps_id<x> to follow the guidelines adopted during D2.1 comment resolution.

SuggestedRemedy

Add a second sentence to the definition of dsp_ps_id<x> that states:
"The value of dsp_ps_id<x> is set by the DSP lock state diagram (see Figure 184-9)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **184** *SC* **184.7.2.2** *P* **608** *L* **48** # 354

Slavick, Jeff — Broadcom

Comment Type **T** *Comment Status* **A** *(B1p) (L)*

restart_lock uses the phrase "M PS" which looks a bit odd. Make it more generic and less defining how the decision to restart the lock occurs, that's what the FSM does.

SuggestedRemedy

Change "M" to "too many"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment makes a valid point that the use of the constant M in the phrase "... when M PS symbols ..." is not easy to understand. It would be clearer and match similar state diagrams in other clauses to remove the M and N constants and just use the values of 8 and 12.

Also note that "PS" is defined in Clause 184 as an acronym for "pilot symbol", but it is defined in Clause 186 to mean "pilot sequence". In this case it would be better to write out "pilot symbols" to remove any ambiguity.

In the Figure 184-9 state diagram,
Replace "M" with "8".
Replace "N" with "12".

Remove subclause 184.7.2.1 with the definitions of constants M and N.

In 184.7.2.2, change the first sentence of the definition of restart_lock,
From:
"A Boolean variable that is used to restart the synchronization process for both polarization symbol streams when M PS symbols in a row fail to match within either polarization symbol stream."
To:
"A Boolean variable that is used to restart the synchronization process for both polarization symbol streams when 8 pilot symbols in a row fail to match the expected values within either polarization symbol stream."

Make similar changes of "PS" to "pilot symbol" or "pilot" or "pilot sequence" as appropriate throughout Clause 184.

Implement with editorial license.

Cl **184** *SC* **184.7.2.2** *P* **609** *L* **15** # 369

Opsasnick, Eugene — Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

The definition of test_ps refers to the FIND_1ST state but it should also point to the state diagram with that state.

SuggestedRemedy

Change the defintion of the test_ps variable
From:
"A Boolean variable that is set to true when a candidate PS symbol position is available for testing and false when the FIND_1ST state is entered."
To:
"A Boolean variable that is set to true when a candidate PS symbol position is available for testing and false upon entering the FIND_1ST state of the DSP lock state diagram (See Figure 184-9)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **184** *SC* **184.7.3** *P* **611** *L* **47** # 338

Slavick, Jeff — Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

Part of the line below LOCK_DONE is missing

SuggestedRemedy

Make the line whole

Response *Response Status* **C**

ACCEPT.

Cl **184** SC **184.7.3** P**612** L**6** # 366

Opsasnick, Eugene — Broadcom

Comment Type **TR** *Comment Status* **A** *Deskew (L)*

The value of the variable alignment_status follows the value of the alignement_valid as defined in Figure 184-10. Therefore alignment_status can be removed, and alignment_valid used in its place everywhere in clause 184.

Likewise, the variable enable_deskew always has the opposite value of alignment_valid and can also be removed. Especially since enable_deskew is not used anywhere in Clause 184, it should be remove.

This means the deskew state diagram figure 184-10 is not needed. And the variable all_locked is also not needed.

SuggestedRemedy

Delete state diagram figure 184-10. Delete line 8 on page 610 which refers to Figure 184-10. Remove SM2 from 184.11.4.4.

Delete variables alignment_status, enable_deskew, and all_locked from the variables definition list in 184.7.2.2.

Whereever "alignment_status" appears in the text of Clause 184, replace it with alignment_valid. It appears twice in 184.3 and in the definitions of the counters in 184.5.7.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The CRG reviewed slides #9-14 of the editorial presentation at:
https://www.ieee802.org/3/dj/public/25_11/opsasnick_3dj_01_2511.pdf

Implement the changes on slides 11-13 of opsasnick_3dj_01_2511 with editoral license.

Cl **185** SC **185.1** P**619** L**24** # 244

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **TR** *Comment Status* **A** *(B1) (O)*

A 800G AUI-n can only be implemented in a 800GBASE-LR1 PHY above the Inner FEC. Note A in Table 185-1 points to 176B.6.1, However upon reviewing 176B.1, it is unclear how this text denotes that an AUI can only be above the Inner FEC sublayer.

SuggestedRemedy

Figure 176B-2 is the clearest indication that an AUI can onlly be above the inner FEC sublayer. A reference to this figure should be added to Note A for Table 185-1

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #245.

Cl **185** SC **185.1** P**620** L**13** # 243

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **TR** *Comment Status* **R** *(B1) (O)*

Table 185-1 indicates that there are two optional PMAs - which are further clarified by Note A. However, there is no PMA sublayer denoted in Figure 185-1. Furthermore, a PMA sublayer would be necessary if a physical implementaiton was done - and that would need to be above the Inner FEC sublayer.

SuggestedRemedy

A PMA sublayer above the Inner FEC sublayer should be added to Figu 185-1.

Response *Response Status* **W**

REJECT.
For the 800GBASE-LR1, a PMA is not required above the Inner FEC unless there is an 800GAUI-n. The Inner FEC behaves like a PMA.

Cl **185** SC **185.8.7** P**633** L**13** # 156

Maniloff, Eric — Ciena

Comment Type **E** *Comment Status* **A** *(B1) (O)*

In the expression 10log10[(Imean2 + Qmean2)/Psignal], mean and signal should be subscripts

SuggestedRemedy

Update formatting to put mean and signal as subscripts

Response *Response Status* **C**

ACCEPT.

Cl **185** SC **185.8.8** P**633** L**18** # 157

Maniloff, Eric — Ciena

Comment Type **E** *Comment Status* **A** *(B1) (O)*

In the expression 10log10[(Imean2 + Qmean2)/Psignal], mean and signal should be subscripts

SuggestedRemedy

Update formatting to put mean and signal as subscripts

Response *Response Status* **C**

ACCEPT.

Cl **185** *SC* **185.8.15** *P* **634** *L* **4** # 187

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *(B1) (O)*

The block error ratio requirements in 185.2 refer to the use of test methods 174A.10 or 174A.11 not 174A.9.4 or 174A.9.5

SuggestedRemedy

Change "174A.9.4 or 174A.9.5" to "174A.10 or 174A.11". Change the error mask method reference on page 634 line 5 from "174A.9.4" to "174A.10.4" Make the same changes in section 185.8.16 (page 635 line 18 and 19).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **185** *SC* **185.9** *P* **635** *L* **29** # 14

Brown, Matt — Alphawave Semi

Comment Type **ER** *Comment Status* **A** *(B1) (O)*

The maximum value for ETCC is normatively specified in Table 185-5, which also points to 185.8.6 as a reference. 185.8.6 briefly summarizes the ETCC parameter and points to tables 185-14/15/16 which are in 185.9. And finally 185.9 points to Annex 185A and provoides the tables listed previously. There is no good reason to have this additional subclause 185.9.

SuggestedRemedy

Merge 185.9 into 185.8.6.
Similarly, merge 187.9 into 187.8.6.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **185A** *SC* **185A.2** *P* **941** *L* **15** # 251

Williams, Tom — Cisco

Comment Type **T** *Comment Status* **A** *ETCC (O)*

The consistency of the ETCC methodology can be improved by refining the reference receiver de-embedding process. Specifically, the receiver frequency response should be equalized, and the receiver noise should be whitened prior to the noise-loading stage. This ensures that the estimated ETCC parameters are independent of the receiver, and accurately represent the transmitter characteristics only. A supporting contribution will be provided.

SuggestedRemedy

Implement changes per the supporting contribution

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_11/temprana_3dj_01a_2511.pdf

After CRG discussion, implement slides 27-30 of temprana_01a_2511.

With editorial license.

Cl **185A** *SC* **185A.2.2.1.1** *P* **943** *L* **24** # 119

Pfeifle, Joerg — Keysight Technologies

Comment Type **T** *Comment Status* **A** *(B1) (O)*

The parameters Effective number of bits (ENOB) and Oversampling ratio should be minimum quantities.

SuggestedRemedy

In Tables 185A-1, 185-14 and 187-12, add (min) to the Description for the lines ENOB and oversampling ratio.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **185A** *SC* **185A.2.3** *P* **944** *L* **27** # 120

Pfeifle, Joerg — Keysight Technologies

Comment Type **T** *Comment Status* **A** *ETCC (O)*

There is a contraditction between the introductory description of 185A.2.3 and the descriptions of the individual processing blocks. The last sentence of the second paragraph reads "Processing steps can be consolidated and changed in order but cannot perform any additional signal processing with the purpose of compensating for signal distortions resulting for example from chromatic dispersion, polarization mode dispersion, skews, and crosstalk.", while the added reference post-equalizer description in 185A.2.3.7 states: "A reference post-equalizer for each polarization is placed after the carrier phase recovery, and used to compensate for transmit I-Q skew and transmit I-Q phase error impairments."

SuggestedRemedy

Change the wording in the introductory description to "Processing steps can be consolidated and changed in order but cannot perform any additional signal processing with the purpose of compensating for transmitter signal distortions except for those explicitely mentioned below."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the last sentence of the second paragraph in 185A.2.3 to:
"Processing steps can be consolidated and changed in order but may not perform any additional signal processing with the purpose of compensating for transmitter signal distortions except for those explicitly mentioned below."

Cl **186** *SC* **186.2.4.1** *P* **658** *L* **31** # 375

Opsasnick, Eugene — Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

FEC_total_bits_counter and FEC_corrected_bits_counter are not qualified by pma_alignment_valid, but should be. The counters FEC_corrected_cw_count and FEC_uncoirrected_cw_counter are correctly qualified. This is very similar to the counters in 184.5.7.

SuggestedRemedy

Change the first sentence in the definition of FEC_total_bits_counter
From:
"The FEC_total_bits_counter is a 64-bit counter that counts once for each bit processed by the FEC decoder."
To:
"The FEC_total_bits_counter is a 64-bit counter that counts once for each bit processed by the FEC decoder when pma_alignment_valid is true."

Change the first sentence in the definition of FEC_corrected_bits_counter
From:
"The FEC_corrected_bits_counter is a 64-bit counter that counts once for each bit corrected by the FEC decoder."
To:
"The FEC_corrected_bits_counter is a 64-bit counter that counts once for each bit corrected by the FEC decoder when pma_alignment_valid is true."

Response *Response Status* **W**

ACCEPT.

Cl **186** SC **186.4.2.1** P**658** L**12** # 377

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

PMA_IS_UNITDATA PMA_IS_SIGNAL are using incorrect punctuation.

SuggestedRemedy

Change PMA_IS_UNITDATA to PMA:IS_UNITDATA on line 12 of page 677.

Change PMA_IS_SIGNAL to PMA:IS_SIGNAL on line 8 of page 677.

Change PMD_IS_SIGNAL to PMD:IS_SIGNAL on line 39 of page 677.

Make similar fixes to the service interface signal names as necessary in the rest of Clause 186.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "PMA_IS_UNITDATA" to "PMA:IS_UNITDATA" on line 12 of page 658.
Change "PMA_IS_SIGNAL" to "PMA:IS_SIGNAL" on line 8 of page 677.
Change "PMD_IS_SIGNAL" to "PMD:IS_SIGNAL" on line 39 of page 677.
Make similar fixes to the service interface signal names as necessary throughout Clause 186.

[Editor's note: Change page from 677 to 658.]

Cl **186** SC **186.4.2.1** P**675** L**39** # 370

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

Update the definition of faw_slip_done to follow the guidelines adopted during D2.1 comment resolution.

SuggestedRemedy

Change the definition of the variable faw_slip_done
From:
"A Boolean variable that is set to true when the FAW_SLIP requested by the FAW field lock state diagram has been completed and the next candidate 22-symbol block position is available for testing."
To:
"A Boolean variable that indicates the next candidate 22-symbol block position is available for testing. It is set to true when the FAW_SLIP function completes and is set to false upon entering the GET_BLOCK state of the 800GBASE-ER1 PMA FAW field lock state diagram (see Figure 186-17)."""

Response *Response Status* **C**

ACCEPT.

Cl **186** SC **186.4.2.1** P**676** L**1** # 387

Opsasnick, Eugene Broadcom

Comment Type **ER** *Comment Status* **A** *(B1) (L)*

The variable faws_lock<x> is defined for x = 0:1. However, fam_lock<x> and mfas_lock<x> are defined for x = 0 to 7. It is hard for the reader to follow the state diagrams when different variables use different ranges for the same index variable.

SuggestedRemedy

Change faws_lock<x> to be faws_lock<y> for y = 0 to 1, so it's indexing does not get confused with the version of x that has a range of 0 to 7. Make associated changes to the state diagrams and any usage of the faws_lock<> variables.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Change the index to y as suggested. Update definitions for pma_alignment_valid and pma_all_locked. Update the LOCK_INIT, IS_BAD, and 2_GOOD states in figure 186-17.

Cl **186** SC **186.4.2.1** P**676** L**6** # 372

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

There should be a reference to the state machine which sets first_fam.

SuggestedRemedy

At the end of the first sentence of the definition of first_fam add "(see Figure 186-19)."

Response *Response Status* **C**

ACCEPT.
[Editor's note: Change page number from 677 to 676.]

Cl **186** SC **186.4.2.1** P**676** L**29** # 391

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

Variable definitions should be in alphbetical order.

SuggestedRemedy

Fix the order of the variable definitions in 186.4.2.1. This seem to be limited to moving mfas_lock and mfas_valid. Move any other variables as necessary so all variables are in alphabetical order.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Alphabetize the variables. Varables that start with fec_ need to be moved ahead of those that start with first_,, which will then have those starting with mfas_ in the correct place in the list.

Cl **186** *SC* **186.4.2.1** *P* **677** *L* **13** # 373

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

There should be a reference to the state machine which sets first_pma_pss.

SuggestedRemedy

At the end of the first sentence of the definition of first_pma_pss add "(see Figure 186-17)."

Response *Response Status* **C**

ACCEPT.
[Editor's note: Change page number from 677 to 676.]

Cl **186** *SC* **186.4.2.1** *P* **677** *L* **42** # 378

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

Update the definition of pma_pss_mapping<x> to follow the guidelines adopted during D2.1 comment resolution.

SuggestedRemedy

Add a second sentence to the definition of pma_pss_mapping<x> that states:
"The value pma_pss_mapping<x> is set by the 800GBASE-ER1 PMA FAW field lock state diagram (see Figure 186-17)."
And make the cross-reference a live link.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.2.1** *P* **677** *L* **51** # 379

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *ER1 state diagrams (L)*

The definition of raml_max_count says it indicates a number of 257-bit blocks between alignment markers. This variable is used in state diagram figure 186-21 in comparisons to raml_counter, but it is never set to any value in any of the state diagrams or in text. How is its value actually set?

SuggestedRemedy

If the value of this variable is suppoed to be the number 257-bits between alignment markers as they are inserted by the 800GBASE-R PCS, then add to the definition that the value equals the 800G AM interval of 16k cw * 20 block/cw = 327,680. This number includes the AMs, but if raml_max_count is supposed to be only the number blocks "between" the AMs, not including the AMs, then subtract 16 from this number.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Since the spacing between AMs is fixed, raml_max_count should be defined as a constant rather than a variable.

The CRG reviewed slides #16-18 of the editorial presentation at:
https://www.ieee802.org/3/dj/public/25_11/opsasnick_3dj_01a_2511.pdf.

Implement the changes shown on slides 17 and 18 of opsasnick_3dj_01a_2511 with editorial license.

Cl **186** *SC* **186.4.2.1** *P* **678** *L* **14** # 382

Opsasnick, Eugene Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (L)*

Update the definition of sof_raml to follow the guidelines adopted during D2.1 comment resolution.

SuggestedRemedy

Add a second sentence to the definition of sof_raml that states:
"The value sof_raml is set by the 800GBASE-ER1 FEC sublayer alignment marker location state diagram (see Figure 186-21)."
And make the cross-reference a live link.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.3** *P* **681** *L* **2** # 389

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

There are two required instances of the PMA FAW field lock process state diagram 186-17 - it sets faws_lock<x> for x = 0:1. Many variables used in the state diagram should be indexed, but are not.

SuggestedRemedy

Update these variables in Figure 186-17 to be be indexed (from non-indexed):
test_faw<>
faw_slip_done<>
faw_valid<>
first_pma_pss<>
current_pma_pss<>
faw_match<>
faw_counter<>
faws_bad_count<>

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl **186** *SC* **186.4.3** *P* **682** *L* **1** # 374

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *Deskew (L)*

The value of the variable pma_align_status follows the value of the pma_alignement_valid as defined in Figure 186-18. Therefore, pma_align_status can be removed, and pma_alignment_valid used in its place everywhere in clause 186.

Likewise, the variable pma_enable_deskew always has the opposite value of pma_alignment_valid and can also be removed. Especially since pma_enable_deskew is not used anywhere in Clause 186, it should be remove.

This means the deskew state diagram figure 186-18 is not needed. And the variable pma_all_locked is also not needed.

SuggestedRemedy

Delete state diagram figure 186-18. Delete line 50 on page 679 which refers to Figure 186-18.

Delete variables pma_alignment_status, pma_enable_deskew, and pma_all_locked from the variable definition list in 186.4.2.1.

Whereever "pma_align_status" appears in the text of Clause 186, it can be replaced with pma_alignment_valid; however, it does not seem to appear anywhere else in the clause.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The CRG reviewed slides #9-14 of the editorial presentation at:
https://www.ieee802.org/3/dj/public/25_11/opsasnick_3dj_01_2511.pdf

Figure 186-17 is describing the process of frame alignment for the two polarizations of the coherent signal. There is still a need to deskew the two signals after the frame pattern has been found, but the comment is correct that the state machine in figure 186-18 is not really showing that. The text in 186.3.4.3 notes that deskewing is needed, and could be enhanced to make it clear that the deskew is done based on the FAW field of the frame. The details of exactly how this is done are implementation-dependent. With that clarification, Figure 186-18 can be removed.

Implement the changes on slide 14 of opsasnick_3dj_01_2511 with editorial license.

Cl **186** *SC* **186.4.3** *P* **683** *L* **16** # 388

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

The introduction to the state diagram figures on page 680 states that there are to be 8 instances of the fam lock process process shown in Figure 186-19. The purpose of this state diagram is to set fam_lock<x> to true when lock is achieved and to set it to false when lock is lost. The state diagram should be using separate variables/counters in each instance (like it does for fam_lock<x>), but it is not doing so for some.

SuggestedRemedy

In state diagram 186-19, change fam_counter and fam_counter_done to fam_counter<x> and fam_counter_done<x>. Change fam_valid to fam_valid<x>. Change fam_match to fam_match<x>. Change test_fam to test_fam<x>. Change fam_slip_done to fam_slip_done<x>.Change fam_bad_count to fam_bad_count<x>. Update the variable defintions as appropriate.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy, including updates to the variable definitions in 186.4.2.1.

Implement with editorial license.

[Editor's note: changed page from 684 to 683.]

Cl **186** *SC* **186.4.3** *P* **683** *L* **25** # 386

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *ER1 state diagrams (L)*

In 5_BAD state of state diagram 186-19, the assignment "fam_lock<x> <= false" is redundant with the same assignment in state LOCK_INIT, and should be removed. Setting fec_restart_lock to true will restart all 8 instances of the 186-19 state diagram (x=0 to 7), and they will all go to LOCK_INIT state and each one will set it's fam_lock<x> to false. Having the redundant adsigment in 5_BAD seems to imply that just the single instance is being reset, but if that were the case then fec_restart_lcok should also be indexed with <x> for each instance of the state diagram.

SuggestedRemedy

In 5_BAD state of state diagram Fig. 186-19, remove the assignment of fam_lock<x> to false, and leave only the assignment of fec_restart_lock to true.

Similarly, in the state diagram in Figure 186-17, the assignment of faws_lock<x> to false in state 15_BAD should be removed.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The state machines in Figures 186-17 and 186-19 are run per lane, but if one lane is not locked, the entire signal is down, so losing lock on one lane restarts the entire locking process across all lanes.

The CRG reviewed slides #19-21 of the editorial presentation at: https://www.ieee802.org/3/dj/public/25_11/opsasnick_3dj_01_2511.pdf.

Implement the changes shown on slides 20 and 21 of opsasnick_3dj_01_2511 to Figures 186-19 and 186-17 with editorial license.

Cl **186** *SC* **186.4.3** *P* **683** *L* **27** # 371

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

In Figure 186-19, in state COUNT_NEXT, there seems to be a missing assignment to the first_fam variable. Note that a similar assignment for first_pma_pss is done in the COUNT_NEXT state of Fig. 186-17.

SuggestedRemedy

Add the following statement to the COUNT_NEXT state in Fig. 186-19:
"first_fam <= current_fam"

Response *Response Status* **W**

ACCEPT.

Cl **186** *SC* **186.4.3** *P* **684** *L* **16** # 385

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

The introduction to the state diagram figures on page 680 states that there are to be 8 instances of the multi-frame alignment process shown in Figure 186-20. The purpose of this state diagram is to set mfas_lock<x> to true when alignment lock is achieved and to set it to false when lock is lost. The state diagram should be using separate variables/counters in each instance (like it does for mfas_lock<x>), but it is not doing so for some.

SuggestedRemedy

In state diagram 186-20, change frame_counter and frame_counter_done to frame_counter<x> and frame_counter_done<x>. Change mfas_valid to mfas_valid<x>. Change mfas_bad_count to mfas_bad_count<x>. Update the variable defintions as appropriate.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy, including updates to the variable definitions in 186.4.2.1. Implement with editorial license.

Cl **186** *SC* **186.4.3** *P* **685** *L* **12** # 380

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

In Figure 186-21, the condition to leave the RAML_CNT_INC and re-enter the same state says:
"!raml_align *
block_tx *
raml_counter = raml_max_count"

The last condition of "raml_counter = raml_max_count" looks incorrect. It should either be "raml_counter < raml_max_count" or maybe "raml_counter != raml_max_count"

SuggestedRemedy

Change the condition to leave the RAML_CNT_IN state and go back to itself
From:
"!raml_align *
block_tx *
raml_counter = raml_max_count"
To:
"!raml_align *
block_tx *
raml_counter < raml_max_count"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Note that the suggested remedy is consistent with the baseline in slavick_3dj_optx_01_241219.pdf

Implement the suggested remedy with editorial license.

Cl **186** *SC* **186.4.3** *P* **685** *L* **19** # 383

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

The global transition entry to the state WAIT_FOR_FRAME in state diagram Figure 186-21 says "!mfas_lock". However, mfas_lock is an indexed variable with 8 different values - it is defined as mfas_lock<x>, for x=0 to 7. This condition should probable be taken if any of the 8 mfas_lock<x> variables is false, but it is not possible to tell if it currently means any of the 8 values is false or if all 8 are false or maybe just testing mfas_lock<0>. There is already a variable defined for when any of the values is false.

SuggestedRemedy

Change the condition for the global transition into the WAiT_FOR_FRAME state from "!mfas_lock" to "!fec_all_mfas_locked".

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The 800GBASE-R signal can only be recovered when all 8 of the tributary flows in the ER1 FEC frame are frame and multiframe aligned.

Implement the suggested remedy with editorial license.

Cl **186** *SC* **186.4.3** *P* **685** *L* **23** # 384

Opsasnick, Eugene Broadcom

Comment Type **TR** *Comment Status* **A** *(B1) (L)*

sof_raml is set to the value contained in raml_counter upon entering the WAIT_FOR_FRAME state; however, it should probably only be set after the frame_counter_done is true which indicates a start of frame has been received.

SuggestedRemedy

Move the assignment of "sof_raml <= raml_counter" from the WAIT_FOR_FRAME state to be the first statement in the RAML_CHK state.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

sof_raml is the value of raml_counter at the start of a frame, so it should only be set when the start of a frame has been detected, which is after exiting the WAIT_FOR_FRAME state.

Implement the suggested remedy with editorial license.

Cl **186** *SC* **186.4.3** *P* **685** *L* **26** # 390

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *ER1 state diagrams (L)*

In the state diagram in Figure 186-21, the transition from state WAIT_FOR_FRAME to RAML_CHK is made when frame_counter_done is true. However, this counter is started in a different state diagram and it is very hard to tell how this is working since there are 8 instances of that other state diagram. It would be easier to follow if there were a separate counter for this state diagram that is started locally, and then wait for done and then resetthe done variable in the next state.

SuggestedRemedy

Add a new frame_counter with a unique name for use in the FEC sublayer alignment marker location state diagram.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The CRG reviewed slides #22-24 of the editorial presentation at: https://www.ieee802.org/3/dj/public/25_11/opsasnick_3dj_01_2511.pdf.

Implement the changes described on slide 24 of opsasnick_3dj_01_2511 with editorial license.

Cl **186** *SC* **186.4.3** *P* **685** *L* **36** # 381

Opsasnick, Eugene Broadcom

Comment Type **T** *Comment Status* **A** *(B1) (L)*

In the RAML_INVALID state of the state diagram in Figure 186-21, there is a conditional statement with "if (AML = 0) .". However "AML" is not a defined state diagram variable in 186.2.4.1. It appears to be referring to the value of the 24-bit AML field of the OH data. Suggest changing "AML" to "aml_value" and defining this new variable.

SuggestedRemedy

Change "if (AML = 0) ." to "if (aml_value) = 0) .".

Add new valiable aml_value to list of variable definitions in 186.2.4.1 with definition:

aml_value
Set to the 24-bit value received in the AML fields of the multi-frame overhead (see 186.2.3.5.10).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **186A** *SC* **186A** *P* **950** *L* **18** # 152

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **R** *ER1 test vectors (L)*

No vectors have been provided for the Clause 186 FEC. This sublayer, though well-specified, is very complex and likely it is difficult to ensure interoperability without reference test vectors.

SuggestedRemedy

If no test vectors are provided delete Clause 186 and Clause 187.

Response *Response Status* **W**

REJECT.

The ER1 FEC and PMA are indeed very complex and clearly would benefit from test vectors being available for implementers to use, which is why Annex 186A was created. These PHYs are based on work done in OIF, which includes links to test vectors in their published specification that would work correctly in the case that the alignment marker location feature in clause 186 is not used.

There is no consensus at this time to remove Clauses 186 and 187. A presentation with test vectors to populate Annex 186A is expected for the next draft.

Cl **187** *SC* **187.1** *P* **695** *L* **36** # 246

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **TR** *Comment Status* **A** *(B1) (O)*

An 800G AUI-n can only be implented above the 800GBASE-ER1 FEC Sublayer. Note A in Table 187-1 points to 17B.6.1. However upon reviewing 176B.1, it is unclear how this text denotes that an AUI can only be above the 800GBASE-ER1 FEC Sublayer.

SuggestedRemedy

Figure 176B-2 is the clearest indication that an 800G AUI can onlly be above the 800GBASE-ER1 FEC Sublayer. A reference to this figure should be added to Note A for Table 187-1

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #245.

Cl **187** *SC* **187.3** *P* **697** *L* **18** # 376

Opsasnick, Eugene — Broadcom

Comment Type **E** *Comment Status* **A** *(B1) (O)*

In Figure 187-2, the ER1 FEC, ER1 PMA, and ER1 PMS service interfaces are using underscore where a colon ":" should be.

SuggestedRemedy

Change FEC_IS_UNITDATA.request to FEC:IS_UNITDATA.request
Change FEC_IS_SIGNAL.indication to FEC:IS_SIGNAL.indication
Change FEC_IS_UNITDATA.indication to FEC:IS_UNITDATA.indication

Make similar changes to the PMA and PMD service interface signals in the same figure.

Make similiar fixes throughout Clause 187 as needed.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

[Editor's note: Change page from 658 to 697.]

Cl **187** *SC* **187.6.1** *P* **704** *L* **16** # 21

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(B1) (O)*

UI_RMS and UI_PP are not appropriate units. The nature of the parameter is defined by the description and the related test method.

SuggestedRemedy

Change "UI_RMS" and "UI_pp" to "UI".
Also, in Clause 185 on page 628 line 9 and line 11

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **187** *SC* **187.8.7** *P* **709** *L* **13** # 158

Maniloff, Eric — Ciena

Comment Type **E** *Comment Status* **A** *(B1) (O)*

In the expression 10log10[(Imean2 + Qmean2)/Psignal], mean and signal should be subscripts

SuggestedRemedy

Update formatting to put mean and signal as subscripts

Response *Response Status* **C**

ACCEPT.

Cl **187** *SC* **187.8.8** *P* **709** *L* **19** # 159

Maniloff, Eric Ciena

Comment Type **E** *Comment Status* **A** *(B1) (O)*

In the expression 10log10[(Imean2 + Qmean2)/Psignal], mean and signal should be subscripts

SuggestedRemedy

Update formatting to put mean and signal as subscripts

Response *Response Status* **C**

ACCEPT.