Cl **FM** *SC* **FM** *P* **1** *L* **33** # 332

Zimmerman, George ADI,APLgp,Cisco,Marvell,OnSemi,Sony

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

Likely that this draft will need to consider amendments 802.3da and 802.3dk, both of which are ahead of it in the process. Commenter's review of 802.3dk in working group ballot has noted some overlaps with this amendment.

SuggestedRemedy

Add 802.3da and 802.3dk to the list of amendments considered. Editors are encouraged to review the draft for consistency with 802.3dk especially.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Based on input from the 802.3 working group chair, the order of amendments will be as follows:
Amendment #10: IEEE P802.3da
Amendment #11: IEEE P802.3dk
Amendment #12: IEEE P802.3dj
Amendment #13: IEEE P802.3dg
Using the amendment numbers and order above...
Add 802.3da and 802.3dk to the amendment list on page 1 line 33.
Add 802.3da and 802.3dk to the amendment abstract list on page 13
Add 802.3da and 802.3dk to the amendment list on the cover page (page 1) and the amendment abstract list on page 13.
Add the amendment number (12) to the title on page 1 and page 51 and to the 802.3dj entry on page 13.
Implement with editorial license.

Cl **FM** *SC* **FM** *P* **12** *L* **54** # 284

Maguire, Valerie Copperopolis; aff'l w/ CME Consulting and Cisco

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

Missing information on the P802.3da amendment

SuggestedRemedy

Insert,
"IEEE Std 802.3da™-20xx
Amendment 1X—This amendment to IEEE Std 802.3-2022 specifies additions and appropriate modifications to enhance the 10 Mb/s shared-medium (multidrop) mode of the 10BASE-T1S Physical Layer in a new, multidrop-only physical layer specification (including reconciliation sublayers, management parameters, Ethernet support for time synchronization protocols, and optional power delivery to support multiple Powered Devices on the 10 Mb/s mixing segment)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the resonse to comment #332.

Cl **FM** *SC* **FM** *P* **13** *L* **0** # 468

Slavick, Jeff Broadcom

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

In the Introduction, the describtion of 802.3dj does not list out the annexes.

SuggestedRemedy

Change <annexes> to be Annex 174A through 186A

Response *Response Status* **W**

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

Cl **FM** *SC* **FM** *P* **13** *L* **1** # 333

Zimmerman, George ADI,APLgp,Cisco,Marvell,OnSemi,Sony

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

Likely that 802.3da and 802.3dk will publish before this amendment their abstracts should be included.

SuggestedRemedy

Consult with 802.3 leadership on likely amendment order, insert abstracts for 802.3da and 802.3dk from the latest drafts of those.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the resonse to comment #332.

Cl **FM** *SC* **FM** *P* **13** *L* **1** # 722

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

802.3dk is ahead of this project

SuggestedRemedy

Insert: IEEE Std 802.3dk-202x
This amendment includes changes to IEEE Std 802.3-2022 and adds Clause . This amendment adds Physical Layer specifications and management parameters for 100 Gb/s Ethernet optical interfaces for bidirectional operation over a single strand of single-mode fiber.
Make other changes as appropriate

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the resonse to comment #332.

Cl **00** *SC* **0** *P* **0** *L* **0** # 293

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

The PICS subclause in many clauses and annexes is incomplete.

SuggestedRemedy

Update PICS subclause in all clauses and annexes as necessary.

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* **373** *L* **43** # 615

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The KR specification should use 92.5 ohm impedance for all ERL measurements

SuggestedRemedy

add line in Table 178-14 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **1** *SC* **1.1.3.2** *P* **52** *L* **21** # 469

Slavick, Jeff — Broadcom

Comment Type **E** *Comment Status* **R** *(Common) (bucket)*

Do we need to actually list the number of widths? It's a laundry list just introduce it as a list.

SuggestedRemedy

Change "Four widths" to "The following widths" on pg52 line 21 and line 40
Change "Two widths" to "The following widths" on pg53 line 6
Change "four widths" to "the following widths" on pg55 line 31
Change "four widths" to "the following widths" on pg56 line 19
Change "two widths" to "the following widths" on pg57 line 43

Response *Response Status* **C**

REJECT.
In principle, stating the number of widths is not necessary. However, it is not incorrect and it does clarify how many width variants to expect. The proposed change does not improve the clarity or accuracy of the draft.

Cl **1** *SC* **1.3** *P* **53** *L* **49** # 434

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *non) (bucket) MDI references*

Several items in the normative references list include a specific Draft number. Some of these drafts are no longer available, and in some cases the version number does not match the date indicated (which suggests that a newer draft was intended).

For SFF documents, only the most recent draft (typically with version number x.y.z) is available; older drafts are removed.

Per the IEEE SA style manual (12.3.1 item c): "Draft standards: Unpublished drafts may be used as normative references as long as they are: (-) Dated (-) Readily available (-) Retrievable; A copy of ALL drafts shall be submitted to IEEE SA to be placed on file as an archive."

Thus, if we keep a dated draft, it should be archived in IEEE SA.

This comment pertains to the following references:

"SFF-8665, Rev 1.9.4, April 1, 2022" (QSFP+) - 1.9.4 is a draft that is no longer available. The current draft is 1.9.8. The published version, 1.9, is from 2015, apparently too old.

"SFF-TA-1011 Rev 1.1, April 19, 2024" (SFF cross reference) - revision number does not match the date; Rev 1.1 is from 2019-10-01 and is apparently too old to be referenced by this project. The current draft is 1.1.6.

"SFF-TA-1027, Rev 1.0, April 16, 2024" - (QSFP2 connector, cage, & module) - revision number does not match the date; Rev 1.0 is from 2023-05-30 and does not include QSFP224 as required for this project. The current draft is 1.0.6.

"QSFP-DD/QSFP-DD800/QSFP-DD1600 Hardware Specification for QSFP Double Density 8x Pluggable Transceivers, Rev 7.1, June 25, 2024.7" - this is indeed the current version, but it is a not a draft; there is no reason to refer to a specific version rather than the latest one.

"SFF-TA-1031, Rev 1.0, June 11, 2023, SFP2 Cage, Connector, & Module Specification" - this is indeed the current version (which does not include SFF224, subject of another comment) but it is not a draft; there is no reason to refer to a specific version rather than the latest one.

Since these are normative references that apply to multiple projects, including future ones, they should refer to documents that are available to readers in the future. Thus, we should use undated references where possible. Per the style manual (12.3.2), standards may be deted or undated; but drafts "shall be numbered and dated".

An editor's note may be used to indicate the current draft and as a reminder that "drafts shall be submitted to IEEE SA".

SuggestedRemedy

For each of the indicated references that is a draft, add an editor's note (to be removed before publication) indicating the revision number and date as of D2.1, and a reminder to update to the latest draft revision and date and provide a copy for the archive prior to publication.

Make similar changes as appropriate in the text that refers to these form factors in Annex 179C.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license using the versions provided in the comment.

Cl **1** *SC* **1.3** *P* **53** *L* **53** # 435

Ran, Adee Cisco Systems

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

Footnote 6 refers to OSFP1600, but OSFP is a normative reference not just for OSFP1600 but also for the original OSFP, which is used in the base standard (e.g. clause 136).

Similarly, Footnote 7 refers to QSFP-DD1600, but QSFP-DD is a normative reference for the base standard.

SuggestedRemedy

Delete "1600" in both footnotes.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **1** *SC* **1.3** *P* **53** *L* **54** # 145

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *non) (bucket) MDI references*

This footnote indicates where to find SFP-DD224, QSFP224, and QSFP-DD1600 specifications, but the normative reference associated with this footnote is "QSFP-DD/QSFPDD-800/QSFP-DD1600 Hardware Specification for QSFP Double Density 8x Pluggable Transceivers", which makes no mention of SFP224 or QSFP224, and following the URL in the footnote does not take the reader to a site with documents that have information about SFP-DD224 or QSFP224 formats (nor does the normatively referenced document have that information).

SuggestedRemedy

Align the footnote with the referenced document by replacing "SFP-DD224, QSP224" with "QSFP-DD, QSFP-DD800"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The comment identifies incorrect references to the MDI connector types defined in Annex 179C. The suggested remedy introduces new MDI connector types (QSFP-DD and QSFP-DD800) that are not explicitly reqiured for this document. The footnote should be updated to capture the MDI connector types necessary for this document and that are included in the appropriate reference material.
Resolve using response for Comment #436.

Cl **1** *SC* **1.3** *P* **53** *L* **54** # 436

Ran, Adee Cisco Systems

Comment Type **TR** *Comment Status* **A** *ion) (bucket) MDI References*

QSFP-DD MSA specification is not the reference for SFP-DD224 (which does not exist yet) and QSFP224 (which is an SFF specification).

SuggestedRemedy

Delete "SFP-DD224, QSFP224, and"

Response *Response Status* **W**

ACCEPT.

Cl **1** *SC* **1.4.92g** *P* **54** *L* **40** # 581

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

Currently, the definitions of 1.6TBASE-DR8-2, 200GBASE-DR1-2, 400GBASE-DR2-2, 800GBASE-DR4-2 incorrectly point to Clause 181. They should point to Clause 182.

SuggestedRemedy

1.4.92g 1.6TBASE-DR8-2: IEEE 802.3 Physical Layer ... least 2 km. (See IEEE Std 802.3, Clause 182.)
1.4.104a 200GBASE-DR1-2: IEEE 802.3 Physical Layer ... least 2 km. (See IEEE Std 802.3, Clause 182.)
1.4.134c 400GBASE-DR2-2: IEEE 802.3 Physical Layer ... least 2 km. (See IEEE Std 802.3, Clause 182.)
1.4.184ca 800GBASE-DR4-2: IEEE 802.3 Physical Layer ... least 2 km. (See IEEE Std 802.3, Clause 182.)

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **1** *SC* **1.4.92i** *P* **54** *L* **46** # 580

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

Current text: "... using the physical coding sublayer defined in Clause 175 for 1.6 Tb/s operation. (See IEEE Std 802.3, Clause 174.)"

Propose pointing to the correct Clause number.

SuggestedRemedy

Proposed text: "... using the physical coding sublayer defined in Clause 175 for 1.6 Tb/s operation. (See IEEE Std 802.3, Clause 175.)"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **1** *SC* **1.5** *P* **58** *L* **28** # 545

Schreiner, Stephan Rosenberger Hochfrequenztechnik GmbH & Co. KG

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

RLdc and RLcd are mentioned in the abbreviations. Howerver ILdc and ILcd are not mentioned. TCL / LCL and TCTL / LCTL would be also a typical name for the conversion parameters

SuggestedRemedy

Add ILdc and ILcd into the abbreviations or change "RLdc, RLcd, ILdc, and ILcd" into "TCL, LCL, TCTL, and LCTL" within the document

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Add the following abbreviations:
ILcd differential-mode to common-mode insertion loss
ILdc common-mode to differential-mode insertion loss

Cl **30** *SC* **30.3.2.1.2** *P* **61** *L* **11** # 146

Huber, Thomas Nokia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

There is no longer an 800GBASE-ER1 PCS; ER1 and ER1-20 PHYs use the 800GBASE-R PCS.

SuggestedRemedy

Delete the instruction and text to insert 800GBASE-ER1 after 400GBASE-R

Response *Response Status* **W**

ACCEPT.

Cl **30** *SC* **30.3.2.1.2** *P* **61** *L* **16** # 470

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

Clause 186 is not a PCS anymore. So it's just a 800GBASE-R PHY now.

SuggestedRemedy

Remove the text associated with 800GBASE-ER1 from 30.3.2.1.2 and 30.3.2.1.3

Response *Response Status* **W**

ACCEPT.

Cl **30** *SC* **30.3.2.1.3** *P* **61** *L* **31** # 147

Huber, Thomas Nokia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

There is no longer an 800GBASE-ER1 PCS; ER1 and ER1-20 PHYs use the 800GBASE-R PCS.

SuggestedRemedy

Delete the instruction and text to insert 800GBASE-ER1 after 400GBASE-R

Response *Response Status* **W**

ACCEPT.

Cl **30** *SC* **30.5.1.1.2** *P* **62** *L* **27** # 148

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

200GBASE-DR1-2 should be inserted before 200GBASE-DR4 and after 200GBASE-DR1 rather than after 200GBASE-ER4

SuggestedRemedy

Delete the editing istruction that is related to the insertion of 200GBASE-DR1-2. Modify the previous editing instruction to say "Insert the following new entries… before the esntry for 200GBASE-DR4, and remove the space so 200GBASE-DR1 and 200GBASE-DR1-2 are both inserted by the same instruction.

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.5.1.1.2** *P* **62** *L* **30** # 3

Marris, Arthur Cadence Design Systems

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The desription of 200GBASE-DR1-2 should include mention of the inner FEC requirement to distinquish it from the 200GBASE-DR1 description

SuggestedRemedy

Change "200GBASE-R PCS/PMA over single-mode fiber PMD" to "200GBASE-R PCS/PMA with type 200GBASE-R Inner FEC"

Make similar changes to 400GBASE-DR2-2, 800GBASE-DR4-2,and 1.6TBASE-DR8-2)

Change "800GBASE-R PCS/PMA over single-mode fiber PMD" to "800GBASE-R PCS/PMA with type 800GBASE-LR1 Inner FEC over single-mode fiber PMD"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy except:

Change "200GBASE-R PCS/PMA over single-mode fiber PMD" to "200GBASE-R PCS/PMA with type 200GBASE-R Inner FEC over single-mode fiber PMD"

Implement with editorial license.

Cl **30** *SC* **30.5.1.1.2** *P* **63** *L* **36** # 149

Huber, Thomas Nokia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

There is no longer an 800GBASE-ER1 PCS; the ER1 and ER-20 PHYs use the 800GBASE-R PCS. However they do have a unique PMA from other 800GBASE-R PHYs.

SuggestedRemedy

Change the description of 800GBASE-ER1 and 800GBASE-ER1-20 so they begin with "800GBASE-R PCS and 800GBASE-ER1 PMA over single-mode fiber PMD with a reach…"

Response *Response Status* **W**

ACCEPT.

Cl **30** *SC* **30.5.1.1.2** *P* **63** *L* **47** # 150

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

An instruction to insert before 800GBASE-KR8 is the same thing as an instruction to insert after 800GBASE-DR8-2, since they are currently adjacent to each other (and no other task force is adding 800G PHYs). This instruction can be combined with the previous one.

SuggestedRemedy

Delete the editing instruction "Insert the following new entry intro the "APPRROPRIATE SYNTAX" section of 30.5.1.1.2 before the entry for 800GBASE-KR8 (inserted by IEEE Std 802.3df-2024)", and remove the space so that the text for 800GBASE-KR4 is part of the prior instruction.

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.13.1.1** *P* **65** *L* **16** # 151

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The same mgmt registers/attributes are used for ER1 FEC as are used for Inner FEC, but the text here doesn't mention ER1 FEC.

SuggestedRemedy

Change "If a Clause 45 MDIO Interface to PMA/PMD, Inner Fec, WIS, …"
to
"If a Clause 45 MDIO Interface to PMA/PMD, Inner FEC or ER1 FEC, WIS, …"

Change the second bullet from "For Inner FEC:…" to "For Inner FEC or ER1 FEC:…"

Make the same changes to 30.13.1.2 through 30.13.1.12

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1** *P* **71** *L* **48** # 152

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The TimeSync Inner FEC transmit and receive registers are also used for ER1 FEC.

SuggestedRemedy

Change "Time Sync inner FEC …" to "TimeSync inner FEC or ER1 FEC…."

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1** *P* **72** *L* **27** # 153

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

Registers 1.2412 through 1.2423 are used for ER1 FEC as well as Inner FEC.

SuggestedRemedy

Change the "Inner FEC …" to "Inner FEC or ER1 FEC …" for each set of registers in the range.

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.6** *P* **74** *L* **20** # 725

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

as amended by IEEE Std 802.3df-2024

SuggestedRemedy

as amended by IEEE Std 802.3df-2024 and IEEE Std 802.3dk-202x
Show the changes to these bits made by P802.3dj
Similarly in other tables

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The response to comment #332 confirms that 802.3dk is assumed to precede 802.3dj.
Implement the suggested remedy with editorial license.

Cl **45** *SC* **45.2.1.6** *P* **74** *L* **41** # 726

Dawe, Piers — Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

So that the reviewers can confirm that the new material is inserted in the correct place, in the correct style, and without using a bit that's already taken

SuggestedRemedy

Please show the sub-rows below and above, each time.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Add to the bottom of the description unchanged row:
1 0 0 0 0 1 0 1 = 800GBASE-DR8-2 PMA/PMD

Cl **45** *SC* **45.2.1.10** *P* **77** *L* **32** # 154

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The text of table 45-14 (not currently included in the document) should be updated to refer to the newly added additional extended ability registers for 200G and 400G PHYs

SuggestedRemedy

Bring in clause 45.2.1.10 and Table 45-14. Update description for a one value for bit 1.11.13 from:
"1 = PMA/PMD has 200G/400G extended abilities listed in register 1.23 or register 1.24"
to:
"1 = PMA/PMD has 200G/400G extended abilities listed in register 1.23 (200G) or registers 1.24 and 1.75 (400G)"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.23** *P* **79** *L* **24** # 155

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The description for bit 1.25.1 should also identify the abilities in register 1.74.

SuggestedRemedy

Change "…. and has the abilities listed in register 1.73" to "… and has the abilities listed in registers 1.73 and 1.74"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.23** *P* **79** *L* **35** # 156

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The editing instruction to insert 45.2.1.23.aa should note that 45.2.1.23.a was inserted by 802.3df-2024

SuggestedRemedy

Change to say "Insert 45.2.1.23.aa before 45.2.1.23.a (as inserted by IEEE Std 802.3df-2024) as follows:"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.60c** *P* **82** *L* **4** # 5

Marris, Arthur Cadence Design Systems

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Typo, missing "2"

SuggestedRemedy

Change "45.2.1.60c 800G PMA/PMD extended ability register (Register 1.74)" to "45.2.1.60c 800G PMA/PMD extended ability 2 register (Register 1.74)"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.60e.3** *P* **84** *L* **16** # 157

Huber, Thomas Nokia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

This subclauses concerns 1.6TBASE-DR8, but the text refers to 1.6TBASE-DR2.

SuggestedRemedy

Change both instances of "1.6TBASE-DR2" in the text to "1.6TBASE-DR8".

Response *Response Status* **W**

ACCEPT.

Cl **45** *SC* **45.2.1.168a** *P* **95** *L* **6** # 4

Marris, Arthur Cadence Design Systems

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Typo "PRBS" should be "PRBS31"

SuggestedRemedy

Change "The assignment of bits in the PRBS seed value lane 0 register" to "The assignment of bits in the PMA/PMD PRBS31 seed value lane 0 register"
Also change "The assignment of bits in the PMA/PMD training pattern lanes 1 through 7 registers" to "The assignment of bits in the PMA/PMD PRBS31 seed value lanes 1 through 7 registers" on lines 6 and 7 of page 95

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.168b** *P* **96** *L* **3** # 6

Marris, Arthur — Cadence Design Systems

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Typo, missing word "interface"

SuggestedRemedy

Change "The assignment of bits in the PMA/PMD training status register" to "The assignment of bits in the PMA/PMD interface training status register"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.168c** *P* **96** *L* **46** # 554

Nicholl, Shawn — AMD

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

In the first row of Table 45-133c the Bit(s) column contains 1.1476.15:9 text.

SuggestedRemedy

Propose 1.1477.15:9 in the first row of Table 45-133c in the Bit(s) column.

Response *Response Status* **W**

ACCEPT.

Cl **45** *SC* **45.2.1.168d** *P* **97** *L* **13** # 555

Nicholl, Shawn — AMD

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Currently, in the 1.1478.13 row, the Description column contains some incorrect text that is carried over from another table.

1 = PCS lane synchronization is complete. This bit indicates that all_locked_mux is true and deskewed
0 = local_rx_ready or remote_rx_ready is false on any lane of the interface

SuggestedRemedy

Propose the following text:

1 = PCS lane synchronization is complete. This bit indicates that all_locked_mux is true and deskew is complete.
0 = PCS lane synchronization is not complete.

Response *Response Status* **W**

ACCEPT.

Cl **45** *SC* **45.2.1.175** *P* **97** *L* **44** # 158

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The 'inner FEC' TimeSync registers are also used for ER1 FEC

SuggestedRemedy

Change "... PMA/PMD and inner FEC…" to "...PMA/PMD, inner FEC, and ER1 FEC…"

In table 45-139, change "inner FEC" to "inner FEC or ER1 FEC" in the Name and Description columns of rows 1.1800.7 through 1.1800.4

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.177a** *P* **99** *L* **5** # 159

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The 'inner FEC' TimeSync registers are also used for ER1 FEC

SuggestedRemedy

Change the title to "TimeSync FEC sublayer transmit path delay (Registers 1.1813 through 1.1818)"

Add a new first sentence to the first paragraph: "The TimeSync FEC sublayer transmit path data delay registers are used with Inner FEC sublayers and the ER1 FEC sublayer."

Change the rest of the existing text and table to replace 'inner FEC' with 'FEC sublayer'.

Make similar changes to 45.2.1.177b.

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.216** *P* **101** *L* **24** # 557

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Missing a note that this Table 45-180 was amended in 802.3ck-2022.

Missing a new section after the table that describes the new field that is added to the table in P802.3dj.

SuggestedRemedy

Proposed text: "Change Table 45-180 (as amended by IEEE Std 802.3ck-2022) as follows:"

Also propose to add new section:

Insert 45.2.1.216aa before 45.2.1.216.a as follows:

45.2.1.216.aa IFEC degraded SER enable (1.2200.4)

Bit 1.2200.4 enables the IFEC decoder to indicate the presence of a degraded SER when the ability is supported. When set to a one, this variable enables degraded SER detection. When set to a zero, degraded SER detection is disabled. Writes to this bit are ignored and reads return a zero if the IFEC does not have the ability to signal the presence of a degraded SER.

Response *Response Status* **W**

ACCEPT.

Cl **45** *SC* **45.2.1.216** *P* **101** *L* **33** # 556

Nicholl, Shawn AMD

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Missing a space in Table 45-180, row 1.2200.4 description column.

Current text: "1 =IFEC decoder"

SuggestedRemedy

Proposed text: "1 = IFEC decoder"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.217.6a** *P* **103** *L* **3** # 558

Nicholl, Shawn AMD

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

802.3-2022 Clause 152 defines the Inverse RS-FEC sublayer for 100GBASE-R, 100GBASE-P, and 100GBASE-Z PHYs. Sub-Clause "152.6 Inverse RS-FEC MDIO function mapping" contains many references to IFEC. "Table 152-2 -- MDIO/Inverse RS-FEC status variable mapping" contains references to 1.2201 register.

P802.3dj Sub-Clause "186.7 Management variables" also contains references to IFEC. "Table 186-8 -- 800GBASE-ER1 FEC status variables and MDIO mapping" contains references to 1.2201 register.

Since there are (at least) two IFEC receivers (i.e. one that is described in Clause 152 and one that is describe in Clause 186), it would help the reader to enhance the description found in "45.2.1.217.6a IFEC received local degraded (1.2201.5)" to clarify that this field pertains only to the Clause 186 IFEC. Same comment for "45.2.1.217.6b IFEC received remote degraded (1.2201.4)".

SuggestedRemedy

Proposed text (for 45.2.1.217.6a): "Bit 1.2201.5 is set to one when the 800GBASE-ER1 IFEC receiver detects the value ... consecutive 800GBASE-ER1 FEC frames. Bit 1.2201.5 is set to zero ..."

Note that in the above text, besides adding "800GBASE-ER1", it is also necessary to correct the typo 1.2201.4 (current text) to 1.2201.5 (proposed text).

Proposed text (for 45.2.1.217.6b): "Bit 1.2201.4 is set to one when the 800GBASE-ER1 IFEC receiver detects the value ... consecutive 800GBASE-ER1 FEC frames. Bit 1.2201.4 is set to zero ..."

Response *Response Status* **W**

ACCEPT.

Cl **45** *SC* **45.2.1.222** *P* **104** *L* **8** # 559

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

With the inclusion of lanes up to lane 31, the legacy text no longer reads smoothly in the P802.3dj draft.

Current text: "FEC lane 1, lower 16 bits are shown in register 1.2212; FEC lane 1, upper 16 bits are shown in register 1.2213; FEC lane 2, lower 16 bits are shown in register 1.2214; through register 1.2217 for FEC lane 3, upper 16 bits; and so on."

SuggestedRemedy

Current text: "FEC lane 1, lower 16 bits are shown in register 1.2212; FEC lane 1, upper 16 bits are shown in register 1.2213; FEC lane 2, lower 16 bits are shown in register 1.2214; FEC lane 2, upper 16 bits are shown in register 1.2215; etc."

Response *Response Status* **W**

ACCEPT.

Cl **45** *SC* **45.2.1.258** *P* **109** *L* **3** # 7

Marris, Arthur Cadence Design Systems

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Correct table name

SuggestedRemedy

Change "Table 45–212g—PMA/PMD status 1 register bit definitions" to "Table 45–212g—Inner FEC status 1 register bit definitions"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.258** *P* **109** *L* **22** # 560

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Sub-Clause "177.5.5 Inner FEC decode" defines Inner_FEC_corrected_cw_counter, Inner_FEC_uncorrected_cw_counter, Inner_FEC_total_bits_counter, and Inner_FEC_corrected_bits_counter. "Table 177-8 -- Inner FEC status variables and MDIO mapping" also uses these terms.

Currently, the description column of "Table 45-212h -- Inner FEC corrected codewords counter bit definitions" contains FEC_corrected_cw_counter. And the Name column contains "FEC corrected codewords". It is inconsistent with Sub-Clause 177 as it is missing the word "Inner" in both columns.

The same issue exists in "Table 45-212i -- Inner FEC uncorrected codewords counter bit definitions", "Table 45-212j -- Inner FEC total bits register bit definitions", and "Table 45-212k -- Inner FEC corrected bits register bit definitions".

SuggestedRemedy

Propose updating the description column of "Table 45-212h -- Inner FEC corrected codewords counter bit definitions" to Inner_FEC_corrected_cw_counter and the Name column to "Inner FEC corrected codewords".

Propose similar updates in "Table 45-212i -- Inner FEC uncorrected codewords counter bit definitions", "Table 45-212j -- Inner FEC total bits register bit definitions", and "Table 45-212k -- Inner FEC corrected bits register bit definitions".

Response *Response Status* **W**

ACCEPT.

Cl **45** *SC* **45.2.1.262** *P* **111** *L* **12** # 562

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Currently, the description column of "Table 45-212l -- Inner FEC codeword error bin register definitions" contains inner_FEC_codeword_error_bin_0 through inner_FEC_codeword_error_bin_4, while "Table 177-8 -- Inner FEC status variables and MDIO mapping" contains Inner_FEC_codeword_error_bin_k. In other words, the first letter is capitalized in one case, but not in the other case.

SuggestedRemedy

Propose updating the description column of "Table 45-212l -- Inner FEC codeword error bin register definitions" to contain Inner_FEC_codeword_error_bin_0 through Inner_FEC_codeword_error_bin_4 to enhance searchability of the document.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
When referring to the Inner FEC sublayer the "I" in "Inner" should be capitalized.
Capitalize the word "Inner" in the entries in the description column, that is change "inner" to "Inner".

Cl **45** *SC* **45.2.1.264** *P* **111** *L* **49** # 723

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **R** *(Logic) (bucket)*

PMAL - not defined, and somehow unmemorable. If it were to be kept, it would need to be added to the abbreviations list, but PMA lane / PMAL is used so much less often than PCS lane / PCSL that it's not worth coining an abbreviation for it.

SuggestedRemedy

Change PMAL to PMA lane, throughout the draft

Response *Response Status* **C**

REJECT.
The term PMAL is defined in 176.1.3 and used extensively throughout the 802.3dj standard.

[Editor's note: changed subclause from 45.2.1.26 to 45.2.1.264]

Cl **45** *SC* **45.2.1.264** *P* **112** *L* **5** # 295

Brown, Matt Alphawave Semi

Comment Type **E** *Comment Status* **A** *(Logic) (bucket) possesive*

Use of possesive grammar is inconsistent with similar phrases used through this draft and is unecessary here.

SuggestedRemedy

Change "Lane 0's" to "Lane 0"
Change "Lane 1's" to "Lane 1"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.269** *P* **115** *L* **45** # 10

Marris, Arthur Cadence Design Systems

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Change "lower" to "bottom" to match Annex 178B nomenclature

SuggestedRemedy

Change "lower AUI" to "bottom AUI" in two places

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.1** *P* **116** *L* **37** # 724

Dawe, Piers Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Editor's note (to be removed after first working group ballot): doesn't respect SA balloters

SuggestedRemedy

Change to: Editor's note (to be removed after first SA ballot):
11 times

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Change to: Editor's note (to be removed after first Standards Association ballot): 11 times

Cl **45** *SC* **45.2.3.8** *P* **119** *L* **23** # 160

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Per the style guide, when inserting new subclauses before the first existing subclause, the nomenclature is 'X.Y.Z.a' rather than 'X.Y.Za"

SuggestedRemedy

Change the editing instruction to say "Insert 45.2.3.8.a and 45.2.3.8.b before 45.2.3.8.1"

Response *Response Status* **C**

ACCEPT.

Cl **69** *SC* **69.1.2** *P* **128** *L* **50** # 471

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

Changes to 69.1.2 are missing.

SuggestedRemedy

Amend Figure 69-5 from 802.3df to add on 1.6T the same stack as 800G.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **69** *SC* **69.2.1** *P* **128** *L* **50** # 472

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

Changes to 69.2.1 are missing.

SuggestedRemedy

Amend 69.2.1 to add in the Clause 170 RS and 1.6TMII to the list of MIIs. This clause was amended in 802.3.df.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **69** *SC* **69.2.3** *P* **128** *L* **50** # 473

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

Changes to 69.2.3 are missing.

SuggestedRemedy

Need new paragraph talking about the new PHYs. Add this paragraph after the one 11th paragraph that was amended by 802.3df.
"Backplane Ethernet also specifies 200GBASE-KR1, 400GBASE-KR2, 800GBASE-KR4, and 1.6TBASE-KR8. The 200GBASE-KR1 embodiment employs the PCS defined in Clause 119, the PMA defined in Clause 176, and the PMD defined in Clause 178, and specifies 200 Gb/s operation using 4-level PAM over one differential paths in each direction. The 400GBASE-KR2 embodiment employs the PCS defined in Clause 119, the PMA defined in Clause 176, and the PMD defined in Clause 178, and specifies 400 Gb/s operation using 4-level PAM over two differential paths in each direction. The 800GBASE-KR4 embodiment employs the PCS defined in Clause 172, the PMA defined in Clause 176, and the PMD defined in Clause 178, and specifies 800 Gb/s operation using 4-level PAM over four differential paths in each direction. The 1.6TBASE-KR8 embodiment employs the PCS defined in Clause 175, the PMA defined in Clause 176, and the PMD defined in Clause 178, and specifies 1.6 Tb/s operation using 4-level PAM over eight differential paths in each direction."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **69** *SC* **69.2.3** *P* **128** *L* **50** # 474

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

Changes to 69.2.3 are missing.

SuggestedRemedy

Add reference to Table 174-3 to the last paragraph of 69.2.3 as ameded by 802.3df.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **69** *SC* **69.4** *P* **128** *L* **50** # 475

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

The delay constrain references are missing.

SuggestedRemedy

Add the following 69.3 in the appropriate locations:

For 200GBASE-KR1, normative delay specifications may be found in 117.1.4, 119.5, 176.8, and 178.6, and also referenced in 80.4.

For 400GBASE-KR2, normative delay specifications may be found in 117.1.4, 119.5, 176.8, and 178.6, and also referenced in 80.4.

For 800GBASE-KR4, normative delay specifications may be found in 170.1.4, 172.5, 176.8, and 178.6, and also referenced in 169.4.

For 1.6TBASE-KR4, normative delay specifications may be found in 170.1.4, 175.5, 176.8, and 178.6, and also referenced in 174.4.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **69** *SC* **69.5** *P* **128** *L* **50** # 476

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

Add dj clauses to the list of clauses the PICS cover. It appears we insert only the "FEC" and "PMD" Clauses in this list.

SuggestedRemedy

Insert in the list of Clauses in the first paragraph of 69.5 as amended by 802.3df: "Clause 175, Clause 178,"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **73** *SC* **73.4.1** *P* **129** *L* **26** # 56

Jones, Chad — Cisco Systems, Inc.

Comment Type **E** *Comment Status* **R** *(Logic) (bucket)*

Use of "may".

SuggestedRemedy

replace "may be" with "are".

Response *Response Status* **C**

REJECT.
The comment does not provide justification for the suggested remedy.

The IEEE SA standards style manual states "The word may is used to indicate a course of action permissible within the limits of the standard (may equals is permitted to)".

The use of the word "may" in the text referred to in 73.4.1 "Multiple technologies may be advertised by the Auto-Negotiation process simultaneously" is appropriate because it is indicating that it is permitted to advertise multiple technologies simultaneously.

Cl **73** *SC* **73.4.1** *P* **129** *L* **31** # 439

Ran, Adee
Cisco Systems

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

"but will not transmit an ability it does not possess"

"will" is not suitable - it is a requirement, not a statement of fact.

"advertise" is typically used for abilities, and is preferable over "send" here.

SuggestedRemedy

Change to "but it shall not advertise an ability it does not possess".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Draft 2.0 deletes the following text in 73.6.2.4: "Multiple technologies may be advertised in the link codeword. A device shall support the data service ability for a technology it advertises. It is the responsibility of the Arbitration function to determine the common mode of operation shared by a link partner and to resolve multiple common modes."

The first and third sentences of the deleted text were moved to "73.4.1 Technology ability" however the second sentence was not moved into 73.4.1 because of the existing "but will not transmit an ability it does not possess" legacy text in 73.4.1.

Becasue the deleted sentence contains the word "shall" it is apropriate to change "will" to "shall" as indicated in the suggested remedy.

Implement suggested remedy and update PICS item LE8 in 73.11.4.3 to point to 73.4.1.

Implement with editorial license and update other Clause PICS subclause references if necessary.

Cl **73** *SC* **73.4.2** *P* **130** *L* **13** # 161

Huber, Thomas
Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

"An Auto-Negotiation able device shall recognize…" is awkward wording.

SuggestedRemedy

Change to "A device capable of Auto-Negotiation shall recognize…"

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.4.3** *P* **130** *L* **27** # 538

Levin, Itamar
Altera corp.

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

20msec are allocated for the signals at the MDI to conform to all of the PHY specifications when the PHY is connected to the MDI through the "Transmit Switch function". The clause is not clear about the event that starts this time period.

SuggestedRemedy

State in line 27 "When a PHY is connected to the MDI through the Transmit Switch function, the signals at the MDI shall
conform to all of the PHY specifications within 20 ms of the AN-GOOD_CHECK state entry.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The relevant state name is "AN_GOOD_CHECK".
Implement suggested remedy with editorial license.

Cl **73** *SC* **73.6.2.4** *P* **134** *L* **1** # 477

Slavick, Jeff
Broadcom

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The table is showing up on the next page which is fine, but the next section begins first and table inserts itself in the middle of list.

SuggestedRemedy

Can you force the table to occur before the next sub-section?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **73** *SC* **73.6.2.5** *P* **133** *L* **50** # 440

Ran, Adee
Cisco Systems

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

"FEC capability (F4, F2, F3, F0, F1) is encoded in bits D43:D47"
three of these bits encode requests, rather than capabilities.

SuggestedRemedy

Change to "FEC capability and request bits (F4, F2, F3, F0, F1) are encoded in bits D43:D47"

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.8** *P* **140** *L* **6** # 727

Dawe, Piers
Nvidia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Cramped table title

SuggestedRemedy

Make its box full width

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **73A** *SC* **73A.1a** *P* **657** *L* **6** # 42

Lusted, Kent
Synopsys

Comment Type **TR** *Comment Status* **A** *(Common) AN host types*

There are now three CR host loss classes for 200 Gb/s per lane PHYs: HL, HN, HH. For interoperability, a host needs to know the host loss class of the partner to determine if the two host end points can support the inserted cable assemble. The local CR host knows apriori of its host class. The local host also can access the cable assemble class via management means such as CMIS contents inside the plug end. However, the partner's host class remains elusive.

Contribution planned for July session.

SuggestedRemedy

Define two new bits in the Extended FEC and Technology Ability Message code link codeword in location D42:43 as "CR Host Class for 200 Gb/s per lane PHYs". Abbreviated EH0:1

D42 D43 Class
0 0 Host Nominal HN
0 1 Host Loss HL
1 0 Host High HH
1 1 Reserved

change the second paragraphs as follows:
"Extended Technology Ability bits EA0:EA27 map to bits D16:D41 (U0:U25), CR Host Class for 200 Gb/s per lane PHYS D42:D43 (U26:U27) and Extended FEC capability bits EF0:EF3 map to bits D44:D47 (U28:31). Reserved fields are sent as zero and ignored on receive."

Update Table 73A-1a appropriately.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In support of this comment, the following contribution was presented to the “Joint logic/optical/electrical ad hoc” on the 26th June:
https://www.ieee802.org/3/dj/public/adhoc/optics/0625_OPTX/lusted_3dj_adhoc_01a_250626.pdf

The following related contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_07/lusted_3dj_02_2507.pdf

Implement the changes outlined on slides 7 and 8 of lusted_3dj_02_2507.

Specify that it is optional to set the value of the bits to a value other than "00".

Implement with editorial license.

Cl **116** *SC* **116.1.4** *P* **148** *L* **6** # 728

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **R** *(Common) (bucket)*

2 or 4 -> two or four

SuggestedRemedy

Change
PHY type and clause correlation (200GBASE copper with 2 or 4 lanes)
to
PHY type and clauses (200GBASE copper with two or four lanes)
and similarly for other tables

Response *Response Status* **C**

REJECT.
The style guide allows some flexibility especially allowing for consistency. The digits 2 and 4 are used here to be consistent with the title of Figure 116-5 which includes "16" that would not be stated in words: "Table 116–5—PHY type and clause correlation (400GBASE optical with 4, 8, or 16 lanes)"

Cl **116** *SC* **116.1.4** *P* **148** *L* **26** # 730

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **R** *(Common) (bucket)*

I don't see why the SM PMA is shown as conditional. It might be needed if one wants a 200GAUI-1 C2C, but that's not to do with the PMD.

SuggestedRemedy

Change C to O and/or revise the footnote. Also in 116-3a 4 and 5.

Response *Response Status* **C**

REJECT.
The SM-PMA is never optional. It is mandatory given some conditions (e.g., there is a 200GAUI-1 C2C or C2M) and not required at all given other conditions (e.g., there is no 200GAUI-1 C2C or C2M).

Cl **116** *SC* **116.2.9** *P* **155** *L* **37** # 732

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) ILT terminology*

Un-introduced, undefined jargon: inter-sublayer link, network path, peer, DATA mode. Also I suspect that "transmitter states, receiver states" misuse "transmitter" "receiver".

SuggestedRemedy

Rewrite this, with appropraite references, or remove 178B. Similarly in e.g. 169.2.10, 174.2.12

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Indeed there are several terms used in the subclause that are defined only in Annex 178B or are not defined at all. Some clarification would be helpful here.
In the second paragraph references to transmitters, receivers, states, and modes are defined in the referenced Annex 178B. Comment #191 proposes a specific qualification to the term "DATA mode".

Change the first paragraph in 116.2.9 to the following:
"Inter-sublayer link training (ILT) facilitates the orderly start-up of an inter-sublayer link (ISL) and coordinates the start-up of a series of ISLs along a path. ILT, ISL, and path are defined in 178B.3 ."
Delete the second paragraph.
Update 169.2.10 and 174.2.12 in a similar way.
Implement with editorial license.

Cl **116** *SC* **116.2.9** *P* **155** *L* **42** # 163

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 116.2.9 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #732.

Cl **116** *SC* **116.2.9** *P* **155** *L* **44** # 733

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *ɔmmon) ILT description types*

is supported by - yuk

SuggestedRemedy

These PHY types include an ILT sublayer:
Also in 169.2.10 and 174.2.12.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Note that ILT is not a sublayer, but rather it is a function within a PMD or AUI component.
Resolve using the response to comment #53.

Cl **116** *SC* **116.2.9** *P* **155** *L* **45** # 164

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *ɔmmon) ILT description types*

ILT is supported by any PHY that uses a 200GAUI-1 or 400GAUI-2. What's listed here are PMDs that support ILT.

SuggestedRemedy

If the intent is to list the PMDs that support ILT, change 'PHY' to 'PMD'. If the intent was to indicate PHYs that can support ILT, replace the sentence that introduces the dashed list with "ILT is supported by any 200GBASE-R PHY that uses a 200GAUI-1. any 400GBASE-R PHY that uses a 400GAUI-2, or any PHY that uses one of the following PMD types:"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #53.

Cl **116** *SC* **116.2.9** *P* **155** *L* **155** # 53

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

Comment Type **TR** *Comment Status* **A** *ɔmmon) ILT description types*

This subclause mistakenly notes ILT for PHY types solely based on what the PMD can do. A PHY may also support ILT if using 200Gb/s based AUIs or the physical layer can support ILT if an extender based on a 200 Gb/s AUI is used.
The same is also true for 169.2.10, and 174.2.12

SuggestedRemedy

Implement language on Page 6 of https://www.ieee802.org/3/dj/public/adhoc/electrical/25_0605/dambrosia_3dj_elec_02_250605.pdf with editorial license for each of the subclauses noted.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The suggested remedy appears to point to the wrong contribution. The correct URL is: https://www.ieee802.org/3/dj/public/adhoc/electrical/25_0605/dambrosia_3dj_elec_01_250605.pdf

Slide 3 of dambrosia_3dj_elec_01_250605 proposes text relating to inclusion of ILT in the form:
Physical layer implementations support ILT if any of the following is included:
PMDs: <list of PMD types>
AUIs: <list of AUI types>

However, ILT is a function within a PMD or AUI component. Referencing it in terms of the entire Physical Layer implementation may imply more than intended. It is sufficient to merely guide readers in right direction.

Instead use the form:
ILT is used by the following PMD and AUI types:
<list of PMD types and AUI types>

Change the ILT/PHY support statements in 116.2.9 third paragraph, 169.2.10 second paragraph, and 174.2.12 second paragraph to the form shown above including the PMD and AUI types listed in slide 3 of dambrosia_3dj_elec_01_250605.

Implement with editorial license.

Cl **116** *SC* **116.3.2** *P* **156** *L* **48** # 8

Marris, Arthur — Cadence Design Systems

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

Strikethrough and underlining not correct on line 48

SuggestedRemedy

Correct underlining and strike throughs to indicate change from "in Figure 116–2 and Figure 116–3," to "in Figure 116–2 through Figure 116–3a". That is strikethrough "and Figure 116–3" and underline "through Figure 116–3a"

Response *Response Status* **C**

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

Cl **116** *SC* **116.3.2** *P* **157** *L* **6** # 672

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

Primitives for other instances, of inter-sublayer interfaces, are

SuggestedRemedy

Too many commas

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Remove both commas using appropriate editorial mark-up.
Implement with editorial license.

Cl **116** *SC* **116.3.3.3.1** *P* **161** *L* **4** # 165

Huber, Thomas — Nokia

Comment Type **ER** *Comment Status* **A** *(bucket) ILT service interface*

The text regarding the values of the SIGNAL_OK parameter is not sufficiently clear in a number of aspects. As the first paragraph states, IN_PROGRESS and READY are only supported if ILT is supported. The paragraphs about the OK and FAIL values refer to "if the service interface supports the values IN_PROGRESS and READY", which is needlessly complex wording; the condition is more succinctly expresed as "if ILT is supported", rather than if the states that ILT uses are supported. Further, since the meanings of OK and FAIL are different depending on whether ILT is used, instead of saying 'here are four values of SIGNAL_OK', and embedding in those definitions the details of whether ILT is used or not, it would be more clear to say 'SIGNAL_OK has these values if ILT is used, and these values if ILT is not used'.

SuggestedRemedy

Replace the second through fifth paragraphs with this text (text spills beyond the bottom of the cell):
If ILT is not used:
A value of OK indicates that communication with the next lower sublayer is established (but does not guarantee that valid data is being presented to the next higher sublayer).
A value of FAIL indicates that the sublayer has not established commuication to the next lower sublayer, and data is not being presented to the next higher sublayer (the rx_symbol parameters are undefined).
If ILT is used:
A value of OK indicates that valid data is being presented by the sublayer to the next higher sublayer in the rx_symbol parameters.
A value of READY indicates that commuication is established with the next lower sublayer, but communication with the peer interface is not fully established yet. The rx_symbol parameters presented to the next higher sublayer do not respresent traffic data and might be invalid. Management intervention is not required.
A value of IN_PROGRESS indicates that the sublayer is establishing communication with the next lower subalyer. Data is not being presented by the sublayer to the next higher sublayer (the rx_symbol parameters are unspecified). Management intervention.is not required.
A value of FAIL indicates that an attempt to communicate with the next lower sublayer has failed. Data is not being presented to the next higher sublayer (rx_symbol parameters are unspecified)

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Note that this comment is proposing to rearrange the text so that it is easier to parse. The proposed changes are an improvement to the clarity of the draft.

Some of the details, such as the context of ILT, might be affected by resolution of other D2.0 comments.

Implement the suggested remedy with editorial license with consideration of other related

comments.

Cl **116** *SC* **116.5** *P* **167** *L* **32** # 457

Slavick, Jeff — Broadcom

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

The laundry list of PMA types that do odd lane skew is more clear if it's a comma separated list instead of using multiple "or" options.

SuggestedRemedy

Change "by the 200GBASE-R 1:8 or 8:1 PMA or 400GBASE-R 2:16 or 16:2 PMA if the PHY includes any of these PMA types."
To: "by the 200GBASE-R 1:8 PMA, 200GBASE-R 8:1 PMA, 400GBASE-R 2:16 PMA and 400GBASE-R 16:2 PMA if the PHY includes any of these PMA types. "

Response *Response Status* **C**

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

Cl **116** *SC* **116.5** *P* **167** *L* **32** # 456

Slavick, Jeff — Broadcom

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

Footnote D is new but not underlined. The new references in the Notes sections are appropriately underlined.

SuggestedRemedy

Underline footenote d and its references in Table 116-8

Response *Response Status* **W**

ACCEPT.

Cl **116** *SC* **116.5** *P* **168** *L* **9** # 674

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

106.25 GBd PMD lane
In footnotes: at PMD lane signaling rate

SuggestedRemedy

106.25 GBd lane ... at lane signaling rate (3 times, presumably not for 113.4375 GBd).
Also in Table 169-6.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The comment is pointing out that the columns and related footnotes (113.4375 GBd excepted) are relevant to AUI lanes as well as PMD lanes, so it should refer generically to "lanes".
Implement the suggested remedy with editorial license.
[Editor's note: CC: 116, 169]

Cl **119** *SC* **119.2.1** *P* **174** *L* **9** # 675

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

data-units

SuggestedRemedy

data units

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

It is noted that in the published draft in the context of the service interface, some clauses use "data units" whereas other clauses use "data-units". Clause 119 uses "data-units".

In the second sentence of 119.2.1 change "data units" to "data-units" to be consistent with the first sentence in 119.2.1, and with the rest of subclause 119.2.1 in the published draft.

Cl **119** *SC* **119.2.4.1** *P* **174** *L* **52** # 67

Bruckman, Leon — Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Missing dot

SuggestedRemedy

Add a dot at the end of the phrase (after "payload")

Response *Response Status* **W**

ACCEPT.

Cl **120** *SC* **120.1.4** *P* **184** *L* **11** # 677

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **R** *(Logic) (bucket)*

Confusion between output and transmit side (possibly also in items 5 and 6)

SuggestedRemedy

Change " the signaling rate range for a ... PMA output" to " the signaling rate range in the transmit direction for a ... PMA"

Response *Response Status* **W**

REJECT.
For a PMA connected to an xAUI-n in the same "package" as the PCS, the PMA output can only be in the transmit direction. The text is correct as written.

Cl **120F** *SC* **120F.1** *P* **662** *L* **1** # 539

Levin, Itamar — Altera corp.

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucket)*

In light of the approved channel reach for C2C it may not be sufficient to content with optional TXEQ. There are different TX tuning mechanisms in C2C and C2M and also in the functional specifications (see 176C.3) which may cause confusion.

SuggestedRemedy

Align this sub-clause with annex 176C.3 functional specification

Response *Response Status* **W**

REJECT.
Annex 120F is for C2C at 100 Gb/s per lane and was added by 802.3ck-2022.
In 802.3ck, the 1.6TAUI-16 C2C maximum IL recommendation is 20 dB at 26.56 GHz (120F.4) and Tx equalization is included in the electrical specifications (120F.3.1.5).
This amendment adds a 16-lane interface, 1.6TAUI-16, but does not change any of the specifications other than the width.

Cl **120F** *SC* **120F.1** *P* **663** *L* **38** # 573

Nicholl, Shawn — AMD

Comment Type **E** *Comment Status* **R** *(Electrical) (bucket)*

The legend for "Figure 120F-1 -- Example 100GAUI-1, 200GAUI-2, 400GAUI-4, 800GAUI-8, and 1.6TAUI-16 C2C relationship to the ISO/IEC Open System Interconnection (OSI) reference model and the IEEE 802.3 Ethernet model" is quite noisy (cluttered).

Readability could be enhanced with a more concise approach.

SuggestedRemedy

In the left-hand column of the legend, propose replacing "ATTACHMENT UNIT INTERFACE" with "AUI", replacing "MEDIA INDEPENDENT INTERFACE" with "MII", and replacing "PHYSICAL MEDIUM ATTACHMENT" with "PMA".

In the right-hand column of the legend propose adding "AUI = ATTACHMENT UNIT INTERFACE", adding "MII = MEDIA INDEPENDENT INTERFACE", adding "PMA = PHYSICAL MEDIUM ATTACHMENT".

There are other Figures throughout P802.3dj (especially in the Annexes) whose legend could be improved in a similar manner.

Response *Response Status* **C**

REJECT.
Figure 120F-1 exists in the base standard 802.3df and was only modified to add the new 1.6TAUI-16 C2C.
The suggested changes (in 120F and elsewhere in the draft) would make the figures different from numerous similar figures in existing clauses, would require significant editorial work and would not substantically improve the clarity of the figure.
Also, the suggested definitions for "AUI" and "MII" are inconsistent with existing defintions of these terms in 1.4.198 and 1.4.393, which are specific to 10 Mb/s and 100 Gb/s, respectively.

Cl **169** *SC* **169.1.3** *P* **186** *L* **10** # 678

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **R** *(Common) (bucket)*

800 Gb/s PHY using - they all are, it's in the text that introduces the table, and its title. This table is too long and wordy; it uses sentence construction rather than columns. At least make a start.

SuggestedRemedy

Change "800 Gb/s PHY using" to "Uses"

Response *Response Status* **C**

REJECT.
The reference text is a complete definition of a PHY type. A significant characteristic of the PHY type is that it supports 800 Gb/s data rate. The definition as written is consistent with many other definitions for previously defined PHY types of many different data rates.

Cl **169** *SC* **169.2.4b** *P* **190** *L* **3** # 680

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **R** *(Common) (bucket)*

In the title: FEC sublayer -> plural, or spell them out

SuggestedRemedy

800GBASE-R Inner FEC, 800GBASE-LR1 Inner FEC and 800GBASE-ER1 FEC sublayers

Response *Response Status* **C**

REJECT.
The subclause defines a general category of FEC sublayers, similar to the way 169.2.4a defines a set of two 800GAUI-n types. It is clear when reading the content of the subclause that there are multiple types as listed in the suggested remedy.
The proposed change does not improve the clarity or accuracy of the draft.

Cl **169** *SC* **169.2.10** *P* **190** *L* **35** # 681

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) ILT terminology*

ILT jargon again.

SuggestedRemedy

See an earlier comment

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #732.

Cl **169** *SC* **169.2.10** *P* **190** *L* **41** # 166

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 169.2.10 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #732.

Cl **169** *SC* **169.2.10** *P* **190** *L* **42** # 297

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *ɔmmon) ILT description types*

ILT is supported not just in the PHYs, but also in the xMII extenders and not limited to the PHY types listed here.

SuggestedRemedy

Change to:
A physical layer implementation supports ILT if any of the following are implemented: 800GBASE-KR4, 800GBASE-CR4, 800GBASE-DR4, 800GBASE-FR4-500, 800GBASE-DR4-2, 800GBASE-FR4, 800GBASE-LR4, 800GAUI-4 C2C, 800GAUI-4 C2M.
Update 116.2.9 and 174.2.12 similarly.
Implement with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #53.

Cl **169** *SC* **169.2.10** *P* **190** *L* **43** # 167

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *ɔmmon) ILT description types*

ILT is in principle supported by any 800GBASE-R PHY that uses a 200G/lane AUI. The dashed list here is the PMDs that can support ILT.

SuggestedRemedy

If the intent is to list the PMDs that support ILT, change 'PHY' to 'PMD'. If the intent was to indicate PHYs that can support ILT, replace the sentence that introduces the dashed list with "ILT is supported by any 800GBASE-R PHY that uses an 800GAUI-4 or one of the following PMD types:"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #53.

Cl **169** *SC* **169.3.2** *P* **191** *L* **17** # 168

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

While the ER1 FEC is an example of a segmented FEC, that term isn't being used elsewhere in the text, so probably better to call it the ER1 FEC here.

SuggestedRemedy

Change "Segmented FEC" to "ER1 FEC":

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Subclause 169.2.4b defines generically the FEC sublayer which is inclusive of all of these and perhaps others to be added in future amendments.
Change "Inner FEC or Segmented FEC" to "FEC sublayer (see 169.2.4b)".

Cl **169** *SC* **169.3.2** *P* **191** *L* **17** # 563

Nicholl, Shawn AMD

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

Current text: "... between the Inner FEC or Segmented FEC, and the PMA, PCS ..."

This is the first (and only) mention of "Segmented FEC" in P802.3dj document.

SuggestedRemedy

Proposed text: "... between the Inner FEC or 800GBASE-ER1 FEC and the PMA, PCS ..."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to commet #168.

Cl **169** *SC* **169.3.2** *P* **193** *L* **38** # 564

Nicholl, Shawn AMD

Comment Type **T** *Comment Status* **R** *(Common) (bucket)*

There is no figure showing 800GBASE-R inter-sublayer service interfaces including 800GBASE-ER1 FEC.

SuggestedRemedy

After "Figure 169-2a-800GBASE-R inter-sublayer service interfaces including 800GBASE-R Inner FEC" add a new figure "800GBASE-R inter-sublayer service interfaces including 800GBASE-ER1 FEC".

Response *Response Status* **C**

REJECT.
The paragraph on page 191 line 26 points to Figure 187-2, which indeed includes the 800GBASE-ER1 FEC sublayer and the FEC service interface above.

Cl **169** *SC* **169.4** *P* **196** *L* **12** # 341

de Koos, Andras Microchip Technology

Comment Type **T** *Comment Status* **R** *(Common) PLI Delay*

The main reason for specifying the max delay constraints is to accommodate PAUSE reach - given the delays in the near-end and far-end physical layers, and given the buffer depth on the near-end, there is a maximum length of medium that can be supported while guaranteeing no buffer overflow when using link PAUSE.
What are the max delays through the near-end and far-end physical layers? It is not at all clear.
Would the near-end buffer device be designed with some awareness of the near-end physical layer's composition? Maybe, maybe not.
There is never any awareness of the far-end physical layer's componsition. Crucially, the far end may or may not have an MII extender, which adds 2*800ns due to the extra PCSs (plus the delays through the extra PMA layers).
As written, the standard is not very helpful in figuring out the maximum possible delay through the entirety of the physical layer given the range of possible physical layer stacks. To be fair, this deficiency has existed since MII-Extenders were introduced for 200G and 400G PHYs. Before MII extenders, the range of physical layer stacks were quite limited, so the delay error-bars due to an extra AUI+PMA, for example, were small.

Same comment can apply to 200Gb/s, 400Gb/s and 1.6Tb/s clauses.

SuggestedRemedy

Consider adding the values that an implementor needs, i.e. the worst-case delay (i.e. over ALL possible physical layer stacks) through the entire physical layer, per PMD type.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **169** *SC* **169.5** *P* **198** *L* **14** # 169

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

In Figures 169-4 and 169-5, it needs to be more clear that "Inner FEC" can also be the ER1 FEC.

SuggestedRemedy

Replace "Inner FEC" in both figures with "Inner FEC or ER1 FEC".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Neither sublayer stack in Figure 169-4 is representative of PHY types that include the FEC sublayer defined in Clause 184 or Clause 186.
The right-hand sublayer stack is quite specific to the Inner FEC defined in Clause 177 in that the PMA is n:4, whereas the PMA above the Clause 184 and Clause 186 FEC sublayers is n:32.
Update the figure to be inclusive of PHY types using the FEC sublayer defined in Clause 184 and Clause 186.

Cl **169** *SC* **169.5** *P* **199** *L* **1** # 565

Nicholl, Shawn — AMD

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

Text above "Figure 169-5 -- 800GBASE-R Skew points for a PHY with two 800GAUI-n" contains a typo.

Current text: "Replace Figure 169-4 with the following figure:"

SuggestedRemedy

Proposed text: "Replace Figure 169-5 with the following figure:"

Response *Response Status* **W**

ACCEPT.

Cl **169** *SC* **169.5** *P* **201** *L* **36** # 327

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

In Table 169-6, footnotes a and b are identical.

SuggestedRemedy

Merge footnote a and b into a single footnote.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Footnote a and b are indeed the same. However, footnote a is incorrect.
Change footnote a to the following:
"The symbol ~~ indicates approximate equivalent of maximum Skew Variation in bits based on 1 bit time equals 37.64706 ps at PCS lane bit rate of 26.5625 Gb/s."

Cl **169** *SC* **169.8** *P* **201** *L* **48** # 170

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

Subclause 169.8 (PICS summary) needs to be updated to refer to new PMD clauses added by 802.3dj.

SuggestedRemedy

Bring in clause 169.8

Add this editing instruction:
Change the first paragraph of subclause 169.8 (as added by IEEE Std 802.3df-2024) as follows

Copy in the first paragraph of the existing 169.8, and change "Clause 170 through Clause 173" to "Clause 170 through Clause 173 or Clause 176 through Clause 187:"

Response *Response Status* **C**

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

Cl **171** *SC* **171.1** *P* **211** *L* **24** # 566

Nicholl, Shawn AMD

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

In the legend for Figure 171-1 -- "800GXS and 1.6TXS relationship to the ISO/IEC Open System Interconnection (OSI) reference model and the IEEE 802.3 Ethernet model" several lines are wrapping onto a second line. It decreases readability.

Currently "1.6TAUI-n = 1.6 Tb/s n-LANE ATTACHMENT UNIT INTERFACE" is wrapping.
Currently "800GAUI-n = 800 Gb/s n-LANE ATTACHMENT UNIT INTERFACE" is wrapping.

SuggestedRemedy

Propose the following text:

Option1) Propose modifying the legend to move the second column (i.e. DTE, MAC, MDI, etc.) further to the right. That should allow space to avoid the text wrap. See "Figure 171-3a -- Example 1.6TBASE-R PMA layering with 1.6TXS" for an example of this solution.

Option2) Propose using the term AUI in the legend of the figure. The term AUI is already defined in Sub-Clause 1.4.198 "Attachment Unit Interface (AUI)" of 802.3-2022. In other words, for Figure 171-1, propose the legend say "1.6TAUI-n = 1.6 Tb/s n-LANE AUI" and "800GAUI-n = 800 Gb/s n-LANE ATTACHMENT UNIT INTERFACE". Optionally (if deemed necessary by the editors), add a new entry (above DTE) "AUI = ATTACHMENT UNIT INTERFACE" to the legend.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Rearrange appropriately to fix the text wrap.

Cl **171** *SC* **171.1a** *P* **212** *L* **14** # 685

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) MII FLR*

An 800GMII/1.6TMII Extender is expected to meet the frame loss ratio specifications in 174A.4": is partly out of scope

SuggestedRemedy

A 800GMII Extender using SM-PMAs or a 1.6TMII Extender is expected to meet the frame loss ratio specifications in 174A.4

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The constraint is necessary to ensure the FLR budget between a pair of MACs is met.
The specific FLR is inherently met with significant margin if the xAUI-n in the xMII extender are compliant the coresponding specifications.
However, it would be helpful to point this out.
Add an informative note in 171.1a as follows:
"Note--The 800GMII or 1.6TMII Extender inherently meets the expected frame loss ratio if the 800GAUI-n or 1.6TAUI-n are compliant."

Also, in 174A.3 to 174A.7, add a reference to the summary tables in 174A.12.

Cl **171** *SC* **171.3.3a** *P* **216** *L* **25** # 687

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **R** *(Logic) (bucket)*

will is deprecated

SuggestedRemedy

Change will be to is - several places

Response *Response Status* **C**

REJECT.
The use of will in some contexts is deprecated as stated in the IEEE SA Style Manual: "The word will is deprecated and shall not be used when stating mandatory requirements; will is only used in statements of fact." The use of "will" in this case is appropriate as it is a statement of fact, not a requirement.

Cl **171** *SC* **171.9.5.1** *P* **231** *L* **47** # 688

Dawe, Piers
Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

For the PHY XS, this may be a misuse of "Transmit"

SuggestedRemedy

Use separate items for PHY XS and DTE XS

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

For the table in 171.9.5.1 change the text in the feature column for PICS items TF1 and TF2 from "Transmit 64B/66B encoder .." to "64B/66B encoder .."

For the table in 171.9.5.2 change the text in the feature column for PICS items RF13 and RF14 from "Receive 64B/66B decoder .." to "64B/66B decoder .."

Cl **172** *SC* **172** *P* **236** *L* **0** # 240

Cox, Ian
Broadcom

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The header on pages 236-243 reads P802.3df and not dj.

SuggestedRemedy

Change the header from 802.3df to 802.3dj

Response *Response Status* **C**

ACCEPT.

Cl **172** *SC* **172.2.5.2** *P* **242** *L* **9** # 171

Huber, Thomas
Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The text here was modified from "PMA service interface lanes" to "service interface lanes", since the sublayer below the PCS may be a FEC or a PMA. But just saying "service interface lanes" is not sufficiently clear that it is the service interface from the next lower layer.

SuggestedRemedy

Change the first sentence to read:
"The PCS lanes might be received in any order from the service interface below the PCS."

Response *Response Status* **C**

ACCEPT.

Cl **172** *SC* **172.6** *P* **242** *L* **36** # 172

Huber, Thomas
Nokia

Comment Type **E** *Comment Status* **R** *(Logic) (bucket)*

The PMDs for which AN is mandatory are already explained in the tables in clause 169, so there is no need to repeat all of them here. At the same time, it is maybe useful to at least note that the requirements apply to CRn and KRn PMDs.

SuggestedRemedy

Replace "800GBASE-CR8, 800GBASE-CR4, 800GBASE-KR8, or 800GBASE-KR4 PMD" with "800GBASE-CRn or 800GBASE-KRn PMD"

Response *Response Status* **C**

REJECT.
The text is accurate as written and consistent with what was done in previous drafts and similar clauses (e.g. Clause 119). Changing CR8/CR4 to CRn , etc., does not improve the readability of the draft.

Cl **172** *SC* **172.7.4.7** *P* **243** *L* **17** # 173

Huber, Thomas
Nokia

Comment Type **E** *Comment Status* **R** *(Logic) (bucket)*

Easier to say CRn/KRn rather than enumerate all the CRn and KRn PMDs in the PICS

SuggestedRemedy

Replace "800GBASE-CR8, 800GBASE-CR4, 800GBASE-KR8, or 800GBASE-KR4 PMD" with "800GBASE-CRn or 800GBASE-KRn PMD"

Response *Response Status* **C**

REJECT.
The text is accurate as written and consistent with what has been done in previous drafts and similar clauses (e.g. Clause 119). Changing CR8/CR4 to CRn , etc., does not improve the readability of the draft.

Cl **173** *SC* **173.1.1a** *P* **244** *L* **35** # 691

Dawe, Piers
Nvidia

Comment Type **T** *Comment Status* **R** *(Logic) (bucket)*

any ... in Table 169-2 *and* Table 169-3.

SuggestedRemedy

any ... in Table 169-2 *or* Table 169-3.

Response *Response Status* **C**

REJECT.

In this case "and" is accurate since the PMA supports any PMD that is listed in tables 169-2 and 169-3

Cl **173** *SC* **173.4.2** *P* **244** *L* **46** # 174

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

If a conversion from BM to SM PMA is needed, the 8:32 PMA could also connect to a 32:4 PMA (e.g., an 800GBASE-LR4 module that has an 800GAUI-8 host-side interface would need to do this since the optical interface requires the clause 177 inner FEC - so the stack would be 800GBASE-R PCS, 32:8 PMA, [800GAUI-8], 8:32 PMA, 32:4 PMA, 800GBASE-R Inner FEC, 800GBASE-LR4 PMD).

SuggestedRemedy

Add "32:4 SM-PMA, " after PHY 800GXS.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add "800GBASE-R 32:4 SM-PMA" to the list.
Implement with editorial license.

Cl **173** *SC* **173.4.2** *P* **245** *L* **36** # 175

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

Figure 173-3 is missing the possibility that a 32:4 PMA could be connected. Also, the explanatory notes b and c seem unnecessary. It should be quite obvious to any reader that 'inst' is PHY_XS when the sublayer below the PMA is a PHY 800GXS and FEC when it is a FEC sublayer (or PMA when it is a PMA).

SuggestedRemedy

At the bottom of the figure, just under the 32 output lanes and 32 input lanes, add "or 32:4 PMA" after PHY 800GXS, and in the explanation of "inst", add "or PMA" after PHY_XS. Delete notes b and c and the references to them in the explanation of 'inst'.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Update Fig 173-3 to add "800GBASE-R SM-PMA" to the list of sublayers below the PMA.
Update the footnotes below the figure as appropriate.
Implement with editorial license.

Cl **174** *SC* **174.1.4** *P* **248** *L* **30** # 176

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

Table 174-3 is missing clause 73 Auto-Negotiation

SuggestedRemedy

Add a column for Clause 73 Auto-Negotiation and indicate it as Mandatory for both 1.6TBASE-KR8 and 1.6TBASE-CR8.

Response *Response Status* **C**

ACCEPT.

Cl **174** *SC* **174.1.4** *P* **248** *L* **32** # 528

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

Clause 73 auto-negotiation is missing from the electrical Phys in table 174-3. (Compare table 169-2 and tables 116-3 amd 116-3a.

SuggestedRemedy

Add it.

Response *Response Status* **C**

ACCEPT.

Cl **174** *SC* **174.2.1** *P* **248** *L* **48** # 423

Ran, Adee Cisco Systems

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

"MII" is defined in 1.4.393 with reference to Clause 22, which is 100 Mb/s. It is irrelevant for this project. Saying that "The MII is not intended to be physically instantiated" does not match this definition.

"MII" has been used in other clauses in a way that contradicts the definition. This is wrong, and should not be carried on.

The text can say that 1.6T Ethernet uses a specific interface between the RS and the PCS, the 1.6TMII. Or simply use 1.6TMII everywhere instead of MII.

SuggestedRemedy

Change "MII" to "1.6TMII", and change the expanded acronym accordingly, across this clause, with editorial license.

Response *Response Status* **W**

ACCEPT.

Cl **174** *SC* **174.2.5** *P* **249** *L* **39** # 693

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *Common) PMD instantiations*

instantiations - are like placements in IC design one PMA, one placement, one instantiation. 176B.7 describes combinations of PMAs

SuggestedRemedy

Change instantiations to combinations

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The xAUI-n are often introduced as and referred to as “physical instantiations” of the PMA service interface. Thus the word "instantiation" is appropriate based on that convention.

Annex 176B provides guidance on how a set of xAUI-n is to be instantiated within a physical layer implementation and, in particular, how each is delimited with particular PMA types. Changing the word away from "instantiation" would require a great deal of rework.

However, the wording in this regard within 176B.7 can be improved.

Change: "The 1.6TAUI-n instantiations are described in 176B.7."
To: “The 1.6TAUI-n may be instantiated within a Physical Layer implementation as described in 176B.7.”

Make a similar update in 169.2.4a.

Implement with editorial license.

Cl **174** *SC* **174.2.12** *P* **250** *L* **42** # 177

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 174.2.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #732.

Cl **174** *SC* **174.6** *P* **259** *L* **34** # 178

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

Clause 182 is also relevant to 1.6TBASE-R.

SuggestedRemedy

Change "Clause 175 through Clause 180" to "Clause 175 through Clause 180 or Clause 182"

Response *Response Status* **C**

ACCEPT.

Cl **174A** *SC* **174A** *P* **677** *L* **21** # 292

Brown, Matt Alphawave Semi

Comment Type **TR** *Comment Status* **A** *(Common) Error ratio figure*

Diagrams showing the various paths or domains described in 174A.3 through 174A.7 would be very helpful to the reader of the annex.

SuggestedRemedy

Add a diagrams illustrating the paths described in 174A.3 through 174A.7.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In 174A.12, add the figure on slides 7, 10, and 11 in the following contribution:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03_2507.pdf

Add a similar figure for the xMII extender.

For the MAC to MAC FLR, draw the arrow from the interface between the RS and MAC. Also, add the FLR arrow in the optical and electrical PHY diagrams.

Implement with editorial license.

Cl **174A** *SC* **174A.3** *P* **677** *L* **35** # 590

Shrikhande, Kapil Marvell

Comment Type **T** *Comment Status* **A** *(Common) (bucketp)*

In the subclause title "Error ratio allocation for an Ethernet network path", the term "network path" is a bit vague. Network path may mean a multi-hop network path (e.g. End Host to Switch to End host). Should search for a more descriptive term to use instead of "network path". Since the error allocation is from the PLS service interface of one RS to the PLS service interface of the other RS, suggest using "RS-to-RS" ? or MAC-to-MAC ? This is similar to PHY-to-PHY, PCS-to-FEC, etc. terminology used in other sections of this annex.

SuggestedRemedy

Replace "network path" in the subclause title with "RS-to-RS".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Ultimate the path is from MAC to MAC. Also, RS can easily be misinterpreted as meaning RS-FEC.
Change "network path" to "MAC-to-MAC path".

Cl **174A** *SC* **174A.4** *P* **678** *L* **3** # 36

Salvekar, Atul Cadence Design Systems

Comment Type **TR** *Comment Status* **R** *(Common) (bucket)*

Uncorrelated is iid for Gaussian Distributions. However, I believe this not to be the case generally. I believe the correct term to put is in independent and identically distributed (iid) with a Binomial Distribution.

SuggestedRemedy

Change "If the errors at the
input of the RS-FEC are uncorrelated"

to

"If the errors at the
input of the RS-FEC are iid with a Binomial Distribution"

Change other places in 174A with editorial discretion.

Response *Response Status* **W**

REJECT.
Uncorrelated means that the probability of any bit or symbol being errored is independent of errors on any other symbol. This term is used broadly throughout 802.3.
A binomial distribution is a statistical representation probability the number of errors expected within a set of bits or symbols.

Cl **174A** *SC* **174A.5** *P* **678** *L* **10** # 106

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) Error ratio figure*

A figure will make this much more clear

SuggestedRemedy

Add a figure to show the link in 174A.5, 174A.6 and 174A.7

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the repsonse to comment #292.

Cl **174A** *SC* **174A.5** *P* **678** *L* **17** # 591

Shrikhande, Kapil Marvell

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

Cross reference to 174A.6 is missing.

SuggestedRemedy

Add cross reference

Response *Response Status* **C**

ACCEPT.

Cl **174A** SC **174A.6** P **678** L **28** # 585

Nicholl, Gary — Cisco Systems

Comment Type **TR** *Comment Status* **A** *(Common) FLR allocation*

FLR allocation for 800GBASE-ER1/ER1-20.

During the March plenary the consensus was to adopt option# 2 of https://www.ieee802.org/3/dj/public/25_03/brown_3dj_04a_2503.pdf, for the FLR allocation for 800GBASE-ER1/ER1-20.

Also, see the final response to comment #16 in https://www.ieee802.org/3/dj/comments/D1p4/8023dj_D1p4_comments_final_clause.pdf.

An implication of this decision is that 800GBASE-ER1/ER1-20 PHYs are different from other 802.3dj PHYs, in that you are only allowed to have AUIs in the PHY or Extender, but not both (see slide 18 of brown_3dj_04a_2503). For other 802.3dj PHYs you are allowed to have AUIs in both the PHY and the Extender.

This means it is possible to have a host design that contains two AUIs (one in an Extender and one in the PHY) that would not support an 800GBASE-ER1/ER1-20 PHY, but would support all other 802.3dj PHYs.

I don't tihnk that an 800GBASE-ER1/ER1-20 PHY should be treated as a special case.

I propose changing the FLR allocation for the 800GBASE-ER1/ER1-20 PHY to be consistent with all other 802.3dj PHYs, such that there are no restriction on which hosts an 800GBASE-ER1/ER1-20 PHY can be deployed in.

This is essentially option #3 in brown_3dj_04a_2503, where the FLR of a 800GBASE-ER1/ER1-20 PHY, with or without an AUI, is defined as 6 x 10-11 (consistent with all other 802.3dj PHYs). This in turn means reducing the FLR for the ER1-to-ER1 FEC link from 6 x 10-11 to 5.8 x 10-11.

SuggestedRemedy

Change the FLR allocation for 800GBASE-ER1/ER1-20 to implement option #3 in https://www.ieee802.org/3/dj/public/25_03/brown_3dj_04a_2503.pdf.

Make the necessary changes in clauses 187 and 174A.

A suuporting presentation will be provided.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_07/nicholl_3dj_02_2507.pdf

Implement the suggested remedy with editorial license.

Cl **174A** SC **174A.8** P **679** L **24** # 402

Mi, Guangcan — Huawei Technologies Co., Ltd

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

This clause discusses the error ratio tests for 200Gb/s per lane ISLs, whereas this sentence says "A method for constraining the error ratio of a PHY based on error masks using PMA measurements ….."... The test method for PHY is to be discussed in the later subclause of 174A.10

SuggestedRemedy

change the word "PHY" to "ISL" in the mentioned sentence.

Response *Response Status* **W**

ACCEPT.

Cl **174A** SC **174A.8** P **679** L **25** # 401

Mi, Guangcan — Huawei Technologies Co., Ltd

Comment Type **TR** *Comment Status* **R** *(Common) block error ratio*

two method were proposed for block error evaluation. Either by examining the block error histogram being below the Hmax histogram mask, or checking block error ratio being smaller than 1.45e-11. however, when using the Hmax to calculate its corresponding block error ratio, I arrived at 1.55e-11, which is not passing the block error ratio requirement.

SuggestedRemedy

I am strongly confused by this now. no suggested remedy at this time. I will reach out to Adam for help.

Response *Response Status* **C**

REJECT.
The suggested remedy does not provide suffcient detail to implement.

Cl **174A** SC **174A.8.1** P **679** L **38** # 403

Mi, Guangcan — Huawei Technologies Co., Ltd

Comment Type **ER** *Comment Status* **A** *subclause hierarchy (bucket)*

There is only one sub-clause under 174A.8, which is 174A.8.1, no need to have this level in the hierachy.

SuggestedRemedy

remove the hierachy of 174A.8.1, make its sub-clauses 174A.8.x

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The subclause hierarchy could indeed be improved. See related slides in the following editorial contribution:
<URL>/brown_3dj_03_2507

Cl **174A** *SC* **174A.8.1.2** *P* **681** *L* **3** # 586

Shrikhande, Kapil Marvell

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

Stating "5 consecutive PAM4 symbols" is clear, but then the sentence goes on to say "or, equivalently, 10 consecutive bits" which could be confusing since 10 consecutive bits could come from 6 PAM4 symbols. I believe we want it to be 5 consecutive PAM4 symbols.

SuggestedRemedy

Change the sentence to be "Test symbols are defined as non-overlapping groups of 5 consecutive PAM4 symbols", period. I.e. remove the last part "or, equivalently, 10 consecutive bits".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
There is some ambiguity in the wording. However, it is helpful to point out that the set of 5 PAM4 symbols is 10 bits since the error checker is working with bits, not directly with PAM4 symbols.
Change: "Test symbols are defined as non-overlapping groups of 5 consecutive PAM4 symbols or, equivalently, 10
consecutive bits."
To: "Test symbols are defined as non-overlapping groups of 5 consecutive PAM4 symbols (10 bits total)."

Cl **174A** *SC* **174A.8.1.3** *P* **681** *L* **18** # 107

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **R** *(Common) (bucket)*

In Hm(i)(k) it is not clear what m represents.

SuggestedRemedy

Define "m"

Response *Response Status* **W**

REJECT.
The "m" is implicitly defined in the words that follow "Hm (i)(k) is a set of p *measured* 17-bin histograms". In other words, the "m" denotes measured. Note that the subscript m non-italic is a qualifier, not a variable.

Cl **174A** *SC* **174A.8.1.3** *P* **681** *L* **19** # 574

Nicholl, Shawn AMD

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

Current text: "... defined as follows:
- Hm (i)(k) where k < 16 is the is the probability of k test symbol errors in a test block for lane i.
- Hm (i)(16) is the probability of more than 15 test symbol errors in a test block for lane i."

SuggestedRemedy

Propose deleting the duplicate text ("is the is the") and align the text with 174A.8.1.2 and 174A.8.1.4 Sub-Clauses.

Propose the following text:

Option1 (most preferred by commenter): Introduce the term "ratio".

Proposed text: "... defined as follows:
- Hm (i)(k) where k < 16 is the ratio (to total number of test blocks analyzed) of k test symbol errors in a test block for lane i.
- Hm (i)(16) is the ratio (to total number of test blocks analyzed) of 16 or more test symbol errors in a test block for lane i."

Option2 (less preferred by commenter): Retain the term "probability".

Proposed text: "... defined as follows:
- Hm (i)(k) where k < 16 is the probability of k test symbol errors in a test block for lane i.
- Hm (i)(16) is the probability of 16 or more test symbol errors in a test block for lane i."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The current text is not incorrect after addressing the repeating text "is the".
Proposed option 2 is more helpful as it relates the definition to 16 errors rather than 15.
The H_m is indeed calculated as a ratio per the desciption in Option 1 but the result is the probability and this is the quality that we use to determine the statistics.
Implement option 2 in the suggested remedy with editorial license.

Cl **174A** *SC* **174A.8.1.4** *P* **681** *L* **50** # 575

Nicholl, Shawn AMD

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

Current text: "... are 17-bin error histograms representing a count of the number of test blocks with k test symbol errors for k < 16 and a count of the number of test blocks with 16 or more test symbol errors for k = 16."

Reading this text, it sounds like these histograms are simply error counts, while an earlier section defined them as a ratio between error counts and total count.

SuggestedRemedy

Propose the following text:

Option1 (most preferred by commenter): Introduce the term "ratio".

Proposed text: "... are 17-bin error histograms representing the ratio (to total number of test blocks analyzed) of test blocks with k test symbol errors for k < 16 and the ratio (to total number of test blocks analyzed) of test blocks with 16 or more test symbol errors for k = 16.

Option2 (less preferred by commenter): Retain the term "probability".

Proposed text is: "... are 17-bin error histograms representing the probability of k test symbol errors in a test block for k < 16 and the probability of 16 or more test symbol errors in a test block for k = 16.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement option #2 (aligning the wording with 174A.8.1.3) in the suggested remedy with editorial license.

Cl **174A** *SC* **174A.8.1.5** *P* **682** *L* **17** # 576

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

Current text: "For each lane i, measure the error histogram Hm(k) (see 174A.8.1.3) and assign Hm(k) to Hm (i)(k)." However, 174A.8.1.3 does not define Hm(k) -- rather it defines Hm(i)(k).

SuggestedRemedy

Propose to make the text more concise.

Proposed text: "For each lane i, measure the error histogram Hm(i)(k) (see 174A.8.1.3)."

Response *Response Status* **W**

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

Cl **174A** *SC* **174A.8.1.5** *P* **682** *L* **23** # 137

Noujeim, Leesa Google

Comment Type **T** *Comment Status* **R** *(Common) block error ratio*

Eqn 174A.5 is derived from randomly distributed error probabilities (at the specified BER) and so makes no allowance for burstiness of errors; this results in unreasonably tight mask limits especially for the higher bins.

SuggestedRemedy

Adjust the mask to increase the allowed ratio in bins 8-15, and reduce in bins ~1-4 accordingly

Response *Response Status* **C**

REJECT.
As noted in the opening paragraph, this test confirms a pass but does not necessarily indicate a fail. It indicates that if the lane fails this test then it is necessary to test with the more precise metric as defined in 174A.8.1.6.
Any other curve would be based upon some correlation assumption and would fail some cases with uncorrelated errors that should pass.
The suggested remedy does not provide sufficient detail to implement.

Cl **174A** *SC* **174A.8.1.5** *P* **682** *L* **26** # 38

Liu, Cathy Broadcom Inc.

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

The assumption of the equation 174A-6 of BER=1/2 of PAM4 symbol error ratio SER is not always true. When pre-coding is applied, or inner hamming decoding is applied, the assumption will not be hold which results in the error mask is higher.

SuggestedRemedy

Either we ingor the special cases with pre-coding or inner code decoding, but add a note to clarify the assumption. Or we can apply two cases to the equation 174A-6 as following: RSSER = 1 –(1 – 2BER)^5 for no precoding and inner code decoding; and RSSER = 1 –(1 – BER)^5 for precoding or inner code decoding.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **174A** *SC* **174A.8.1.6** *P* **682** *L* **37** # 577

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

Current text: "For each lane i, measure the error histogram Hm(k) (see 174A.8.1.3) and assign Hm(k) to Hm (i)(k)." However, 174A.8.1.3 does not define Hm(k) -- rather it defines Hm(i)(k).

SuggestedRemedy

Propose to make the text more concise.

Proposed text: "For each lane i, measure the error histogram Hm(i)(k) (see 174A.8.1.3)."

Response *Response Status* **W**

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

Cl **174A** *SC* **174A.8.1.7** *P* **683** *L* **2** # 578

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

Current text: "a) For each lane i, measure the error histogram Hm(k) (see 174A.8.1.3)."
However, 174A.8.1.3 does not define Hm(k) -- rather it defines Hm(i)(k).
Current text: "d) ... hconv(He(k) , Hm(k)) (see ..."

SuggestedRemedy

Propose to make the text more concise.

Proposed text: "a) For each lane i, measure the error histogram Hm(i)(k) (see 174A.8.1.3)."
Proposed text: "d) ... hconv(He(k) , Hm(i)(k)) (see ..."

Response *Response Status* **U**

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

Cl **174A** *SC* **174A.9** *P* **683** *L* **17** # 108

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) (bucket)*

This section is not about 200GBASE-LR1

SuggestedRemedy

Change: "200GBASE-LR1" to "800GBASE-LR1"

Response *Response Status* **W**

ACCEPT.

Cl **174A** *SC* **174A.9** *P* **683** *L* **18** # 579

Nicholl, Shawn AMD

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

In the "174A.9 Error ratio tests for 800GBASE-LR1 ISLs", the text current says "... between a pair of 200GBASE-LR1 Inner FEC sublayers ...".

SuggestedRemedy

Propose to replace with "... between a pair of 800GBASE-LR1 Inner FEC sublayers ..."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #108.

Cl **174A** *SC* **174A.10.1.3** *P* **685** *L* **45** # 408

Mi, Guangcan Huawei Technologies Co., Ltd

Comment Type **ER** *Comment Status* **A** *(Common) (bucket)*

missing a word "to"

SuggestedRemedy

change to " expected to be less"

Response *Response Status* **W**

ACCEPT.

Cl **174A** *SC* **174A.12** *P* **686** *L* **22** # 409

Mi, Guangcan Huawei Technologies Co., Ltd

Comment Type **TR** *Comment Status* **R** *(Common) block error ratio*

Table 174A-1, FLR was changed from 6.2e-11 to 6e-11. The reasoning seems to be the 0.2e-11 was allocated to the xMII extenders and PCS to FEC links illustrated in Table 174A-3. However, in reality, no such case as cascading two sets of two-part AUI link would exist. The title of Table 174A-1 "optical PHYs with no FEC sublayer or with an inner FEC sublayer" also indicating that Table 174A-3 does not apply. Essentially, Table 174A-1 doesn't apply to 800GBASE-ER1 and 800GBASE-ER1-20 with xMII extenders, but is using the allocation for such cases.

The change maynot affect the performance of a Ethernet device much, but may cause some confusion of the readers.

SuggestedRemedy

Change back to 6.2e-11 for Table 174A-1. Add another errro allocation table for the case of ER coherent PMDs

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **175** *SC* **175.1.3** *P* **261** *L* **5** # 588

Shrikhande, Kapil Marvell

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

Will be better to state that transcoding is from four 66b blocks to 257 bit blocks. This follows the previous bullet which states that encoding is from eight 1.6TMII data octets to 66-bit blocks.

SuggestedRemedy

Change the second bullet to "Transcoding from (to) four 66-bit blocks to (from) 257-bit blocks (256B/257B)".

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **175** *SC* **175.2.1** *P* **263** *L* **10** # 70

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

PMA is also a sublayer, and inner FEC shall be capitalized

SuggestedRemedy

Change: "PMA or inner FEC sublayer" to: "PMA or Inner FEC sublayers"
And in line 13 change: "inner FEC" to "Inner FEC"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The PCS communicates with either a PMA sublayer or an Inner FEC sublayer (not both at the same time); therefore, the singular "sublayer" is correct. The context is:
"When communicating with the PMA or inner FEC sublayer, the 1.6TBASE-R PCS uses..."
When referring to the Inner FEC sublayer, the "I" should indeed be capitalized.
Change instances of "inner FEC" to "Inner FEC" throughout the draft when referencing an Inner FEC sublayer.
Implement with editorial license.
[Editor's note: CC: 45, 175, 184]

Cl **175** *SC* **175.2.4.10** *P* **272** *L* **13** # 37

Salvekar, Atul Cadence Design Systems

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Put in Generator Polynomial

SuggestedRemedy

Change "X^58 scrambler" to "G(x) =1 + x^39 + x^58"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The "X^58 scrambler" on this page is just a label for this functional block in the figure - using the polynomial itself as the block label would lose the reference that the block is the "scrambler". It would be more appropriate to use the name of the function as defined in the title of subclause 175.2.4.5 "Scrambler" on page 264. The polynomial to be used in the scrambler is defined in the text in that subclause by reference to Equation 49-1.

In figure 175-7, on page 272, change the block labels at line 12
from:
"X^58 scrambler"
to:
"Scrambler"

Cl **175** *SC* **175.2.5.3** *P* **273** *L* **50** # 71

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

There may be undetected errors

SuggestedRemedy

Change: "errors that were not corrected"
to: "errors that were detected but not corrected"

Response *Response Status* **W**

ACCEPT.

Cl **175** *SC* **175.2.6.2.4** *P* **277** *L* **17** # 73

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **R** *(Logic) (bucket)*

The text of the definition of this counter is different from the one in 119.2.6.2.4

SuggestedRemedy

Change the definition of amp_counter to: "This counter counts the interval of 32768 FEC codewords containing normal alignment marker payload sequences."

Response *Response Status* **W**

REJECT.
This counter definition is indeed worded slightly differently from the counter of the same name in 119.2.6.4. However, it matches the wording of the same counter in 172.2.6.2.4. This was discussed at length and the wording was carefully refined during the comment resolution of the 802.3df standard. See comment #I-80 in <https://www.ieee802.org/3/df/comments/D3p0/8023df_D3p0_comments_final_clause.pdf>. Therefore, no change should be made.

Cl **175** *SC* **175.6** *P* **280** *L* **17** # 340

de Koos, Andras Microchip Technology

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

phrasing is awkward: "… path delays are reported as if …, and the PCS_timesync_multilane_ability variable is asserted.
Does this mean that path data delays are reported as if the PCS_timesync_multilane_ability variable is asserted?
The text says "report as if A, and B" when it should say "when B is true, report as if A".

SuggestedRemedy

Rephrase as the sentence as:
When the PCS_timesync_multilane_ability variable is asserted, the transmit and receive path data delays are reported as if the DDMP (data delay measurement point) is at the start of the set of four interleaved RS-FEC codewords (see 90.7)

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.1.4** *P* **290** *L* **35** # 74

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **R** *(Logic) (bucket)*

Not all functions are required in all cases described in this clause, but specific restrictions are only indicated for: Delay alternating PCSLs by two RS-FEC codewords

SuggestedRemedy

If this is a list of general function that are not necessarily needed in all cases then delete: "for 200GBASE-R and 400GBASE-R PMAs".
If it is a full list with restrictions then indicate for which cases each function is used according to the relevant sections.

Response *Response Status* **W**

REJECT.

The intent is to list the general functions used by the SM PMAs. The two RS-FEC codeword delay is specific to the 200GBASE-R and 400GBASE-R PMAs to achieve four-way RS-FEC codeword interleaving and is called out for that reason. The other primary functions are used by all SM PMAs when required.

Cl **176** *SC* **176.4.1** *P* **296** *L* **8** # 78

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

Missing arrowhead

SuggestedRemedy

Add the arrowhead to the input to the PAM4 decode process

Response *Response Status* **W**

ACCEPT.

Cl **176** *SC* **176.4.2.4.2** *P* **300** *L* **29** # 180

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The first sentence has a list of two items separated with a comma rather than 'and'.

SuggestedRemedy

Change the sentence to read: This delay is performed for the 200GBASE-R 8:1 and 400GBASE-R 16:2 PMAs.

Response *Response Status* **C**

ACCEPT.

Cl **176** *SC* **176.4.3** *P* **304** *L* **46** # 299

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The would "may" is to be used for the context "is allowed to".

SuggestedRemedy

Change "is allowed to" to "may".
Implement same in 179.9.5.2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
On page 304, line 46:
change: "the full set of PCS lanes is allowed to proceed though "
to: "the full set of PCS lanes proceeds though "

In subclause 179.9.5.2, on page 406, line 8:
change: "The receiver is allowed to control the"
to: "The receiver may control the"

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

Cl **176** *SC* **176.4.3.2** *P* **305** *L* **16** # 80

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

In the receive function there are processes not steps

SuggestedRemedy

Change: "to the next steps" to: "to the next steps processes"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change from "to the next steps in the receive function flow" to "to the next process in the receive function".

Cl **176** *SC* **176.7.1.2** *P* **316** *L* **11** # 181

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **R** *(Logic) (bucket)*

If the precoder is configured either based on ILT (as in the penultimate paragraph) or is "set as required by the implementation" (as in the last paragraph), what is the purpose of having the set of "precoder_{tx|rx}_{in|out}_enable_i" variables to enable and disable it for each lane/direction? It doesn't sound like the user has any need to control these settings.

SuggestedRemedy

Either remove the variables entirely, or treat them as status variables that report the configuration if there is some value in the user knowing what the configuration is Or, if the intent in the case that ILT is not being used is that the user needs to figure out whether to enable the precoder on a per-lane basis, make that more clear.

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #186
[Editor's note: CC: 176, 177]

Cl **176** *SC* **176.7.1.2** *P* **316** *L* **24** # 449

He, Xiang — Huawei

Comment Type **TR** *Comment Status* **R** *(Logic) (bucket)*

If ILT is disabled by management, how would precoding request signals get carried over to the transmitter side? I understand this is the language we used to define the precoding config before ILT was introduced. Combining this wilt 178B, when bring up a link while disabling the ILT, a Rx without precoding may not be able to start the link with a Tx with precoding turned on?

SuggestedRemedy

For PMDs that require to implement precoding on the transmit side, when ILT is disabled, a default mode should be defined to have precoding disabled, either in 176 or 178B.

Response *Response Status* **W**

REJECT.

Resolve using the response to comment #186

[Editor's note: CC: 176, 177]

Cl **176** *SC* **176.7.2** *P* **316** *L* **28** # 81

Bruckman, Leon Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Missing word

SuggestedRemedy

Change: "When local loopback mode enabled" to: "When local loopback mode is enabled"

Response *Response Status* **W**

ACCEPT.

Cl **176** *SC* **176.8** *P* **318** *L* **7** # 567

Nicholl, Shawn AMD

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

The entries in "Table 176-7 -- Delay constraints" also pertain to 200GBASE-R, 400GBASE-R, and 1.6TBASE-R. They don't just pertain to 800GBASE-R.

Current text: "... the definitions for bit times and pause_quanta can be found in 169.4."

SuggestedRemedy

Proposed text: "... the definitions for bit times and pause_quanta can be found in 116.4, 169.4, and 174.4"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change from
"... the definitions for bit times and pause_quanta can be found in 169.4"
to
"... the definitions for bit times and pause_quanta can be found in 116.4, 169.4, and 174.4".

Cl **176B** *SC* **176B.2** *P* **700** *L* **8** # 270

Wang, Xuebo Huawei

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

"of" is missing between "the number" and "upper".

SuggestedRemedy

Add "of" between "the number" and "upper".

Response *Response Status* **C**

ACCEPT.

Cl **176B** *SC* **176B.2** *P* **701** *L* **40** # 271

Wang, Xuebo Huawei

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

Typo: "my" should be changed to "may".

SuggestedRemedy

Change "my" to "may".

Response *Response Status* **C**

ACCEPT.

Cl **176B** *SC* **176B.3** *P* **702** *L* **22** # 272

Wang, Xuebo Huawei

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

"4:32 BM-PMA" should be changed to "4:32 SM-PMA", as the PMA above it is an SM-PMA.

SuggestedRemedy

Change "4:32 BM-PMA" to "4:32 SM-PMA".

Response *Response Status* **C**

ACCEPT.

Cl **176B** *SC* **176B.4** *P* **702** *L* **40** # 266

Wang, Xuebo Huawei

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

The current content of PMA instantiations seems to include interfaces with all possible data rates per lane. However, for 200 Gb/s and 400 Gb/s physical layer implementations in Annex 176B.4 and Annex 176B.5, some cases are missing. For example, some interfaces with 25 Gbps per lane and 50 Gbps per lane are not included for now. For a complete presentation, it is suggested to add those missing cases.

SuggestedRemedy

1. On Page 702, Line 42: change the title "8:1 and 8:2 PMA instantiations for 200GBASE-R PHYs" to "8:4, 8:2 and 8:1 PMA instantiations for 200GBASE-R PHYs" to include PMD with four 50 Gb/s physical lanes.
2. On Page 703, Line 11: change "n = 2 or 4" to "n = 2, 4 or 8" to include 200GAUI-8 interface.
3. On Page 704, Line 21 and 22: change "{n,p}" to "p". This change is consistent with the style used in Table 176B-1 and avoids the trouble of listing all possible values of n.
4. On Page 704, Line 35, change "120E (C2M)" to "120D (C2C)". This should be a typo.
5. On Page 704, Line 44, change "n = 2 or 4" to "n = 2, 4 or 8" to include 200GAUI-8 interface.
6. On Page 705, Line 11, change "120E (C2M)" to "120D (C2C)". This should be a typo.
7. On Page 705, Line 17, change "n = 2 or 4" to "n = 2, 4 or 8" to include 200GAUI-8 interface.
8. On Page 705, Line 23 and 24: change "{n,p}" to "p". This change is consistent with the style used in Table 176B-1 and avoids the trouble of listing all possible values of n.
9. On Page 707, Line 30, change the title "16:8, 16:4, and 16:2 PMA instantiations for 400GBASE-R PHYs" to "16:16, 16:8, 16:4, and 16:2 PMA instantiations for 400GBASE-R PHYs" to include 400GBASE-SR16 PMD.
10. On Page 707, Line 36, change "p is 2, 4, or 8" to "p is 2, 4, 8, or 16".
11. On Page 708, Line 4, change " 16:{4,8,16}:{4,8}, 16:4:4" to "16:{4,8,16}:{4,8,16}".
12. Change "{4,8}" in table titles to "{4,8,16}" in Line 21 on Page 708, Line 4 and Line 28 on Page 709, Line 4 and Line 30 on Page 710.
13. On Page 708, Line 8, change "n=4" to "n=4, 8, or 16" to include 400GAUI-8 and 400GAUI-16 interfaces.
14. On Page 708, Line 14, change "p=4" to "p=4, 8, or 16" to include PMDs with 8 and 16 physical lanes.
15. On Page 708, Line 34, change "p=4: or 8" to "p=4, 8, or 16" to include PMD with 16 physical lanes.
16. In Line 49 on Page 709 and Line 53 on Page 710, change "p=4 or 8" to "p=4, 8, or 16" to include PMD with 16 physical lanes.
17. On Page 710, Line 15 and 16, change "{m, n}" to "m" since n is not used.
18. On Page 710, Line 17, change "n=4 or 8" to "n=4, 8, or 16" to include 400GAUI-16 interface.
19. On Page 710, Line 20, add "n=16: 120C (C2C)" to include 400GAUI-16 C2C.
20. On Page 710, Line 23, change "{n,p}=4 or 8" to "{n,p}=4, 8, or 16".

A contribution covering all the remedies will be provided.

Response *Response Status* **C**

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

Cl **176B** *SC* **176B.4.2** *P* **706** *L* **1** # 278

Wang, Xuebo Huawei

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

The title should not include "200GBASE-R PHYs" as the sub-clause only talks about Extender. The same issue happens in Line 1 on Page 711 of CL176B.5.2 and Line 27 on Page 715 of CL176B.6.2.

SuggestedRemedy

Delete "200GBASE-R PHYs" in Line 1 on Page 706;
Delete "400GBASE-R PHYs" in Line 1 on Page 711;
Delete "800GBASE-R PHYs" in Line 27 on Page 715.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
For 200G and 400G, there are no defined PHY types that would use the instantiations defined in this subclause. However, there is one defined 800G PHY type that may use these instantiations as noted in the sentence "These instantiations are also relevant to the 800GBASE-R PHY type defined in Clause 185 and shown (with Inner FEC) in Figure 176B–2."
Delete "200GBASE-R PHYs" in Line 1 on Page 706;
Delete "400GBASE-R PHYs" in Line 1 on Page 711;

Cl **176B** *SC* **176B.4.2** *P* **706** *L* **3** # 273

Wang, Xuebo Huawei

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

"Figure 176B-2" should be changed to "Figure 176B-3", as the Extender is shown in Figure 176B-3 instead of 176B-2. The same issue happens in Line 3 on Page 711.

SuggestedRemedy

Change "Figure 176B-2" to "Figure 176B-3" in Line 3 on Page 706 and Line 3 on Page 711.

Response *Response Status* **C**

ACCEPT.

Cl **176B** *SC* **176B.5.1** *P* **710** *L* **10** # 280

Wang, Xuebo Huawei

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

A colon is missing between m=2 and 176. The same happens in Line 16, 19, 24, 36, 42, 45, and 51 on Page 710.

SuggestedRemedy

Add a colon between 2 and 176 in Line 10, 16, 19, 24, 36, 42, 45, and 51 on Page 710.

Response *Response Status* **C**

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

Cl **176B** *SC* **176B.6.1** *P* **713** *L* **28** # 274

Wang, Xuebo Huawei

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

The note should describe how an n:p PMA is formed instead of an m:n PMA

SuggestedRemedy

Change the sentence "The combination of m:32 PMA and 32:n PMA forms an m:n PMA" to "The combination of n:32 PMA and 32:p PMA forms an n:p PMA".

Response *Response Status* **C**

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

Cl **176B** *SC* **176B.6.2** *P* **715** *L* **39** # 279

Wang, Xuebo Huawei

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

PMD does not exist in Extender. The example should be like: an instantiation with a one S 800GAUI-n and one B 800GAUI-n is denoted “SB” or “BS”.

SuggestedRemedy

Change "one B PMD" to "one B 800GAUI-n".

Response *Response Status* **C**

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

Cl **176B** *SC* **176B.6.2** *P* **715** *L* **44** # 275

Wang, Xuebo Huawei

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

The symbol-multiplexed interfaces and bit-multiplexed interfaces are denoted by "S" and "B", respectively, per CL176B.6.2. However, "S" and "B" are missing in the titles of Table 176B-25. The same issue happens in the titles of 176B-26 and 176B-27 in Line 4 and 24 on Page 716. The missing also does not fit with the title style of other tables in Annex 176B.

SuggestedRemedy

Change the title of Table 176B-25 "800 Gb/s 32:4:32 and 32:8:32 PMA instantiations" to "800 Gb/s 32:4:32 and 32:8:32 (S or B) PMA instantiations";
Change the title of Table 176B-26 "800 Gb/s 32:8:8:32 and 32:4:4:32 (n = m) PMA instantiations" to "800 Gb/s 32:8:8:32 and 32:4:4:32 (n = m, BB or SS) PMA instantiations";
Change the title of Table 176B-27 "800 Gb/s PMA 32:4:8:32 and 32:8:4:32 (n≠m) instantiations" to "800 Gb/s 32:4:8:32 and 32:8:4:32 (n≠m, SB or BS) PMA instantiations".

Response *Response Status* **C**

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

Cl **176B** *SC* **176B.7.1** *P* **717** *L* **2** # 276

Wang, Xuebo Huawei

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

"or 8" is redundant.

SuggestedRemedy

Delete "or 8" in Line 2 on Page 717.

Response *Response Status* **C**

ACCEPT.

Cl **176B** *SC* **176B.7.2** *P* **718** *L* **24** # 277

Wang, Xuebo Huawei

Comment Type **E** *Comment Status* **A** *(Common) (bucket)*

"n=16" and "n=8" should be changed to "m=16" and "m=8", as the corresponding row is of 1.6TAUI-m.

SuggestedRemedy

Change "n=16" to "m=16" in Line 24 on Page 718;
Change "n=8" to "m=8" in Line 25 on Page 718.

Response *Response Status* **C**

ACCEPT.

Cl **176C** *SC* **176C.2** *P* **720** *L* **5** # 39

Liu, Cathy Broadcom Inc.

Comment Type **E** *Comment Status* **R** *(Electrical) BER_added*

The BER_added is defined as 2.841 x 10 ^ -4. It is three-bit decimal. Other places in the document are two-bit decimal.

SuggestedRemedy

Change to 2.84 x 10 ^ -4

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #41.

Cl **176C** *SC* **176C.3** *P* **721** *L* **15** # 40

Liu, Cathy Broadcom Inc.

Comment Type **T** *Comment Status* **A** *ctrical) (bucket) C2C channel*

The figure 176C-2 has one mated connector illustrated as the C2C channel. The C2C channel could have no connector or up to one connector. The figure might misleading the readers to "must have one connector" for the C2C interconnect.

SuggestedRemedy

Add a note to clarify that the connector is optional.

Response *Response Status* **C**

ACCEPT.

Cl **176C** *SC* **176C.6.2** *P* **723** *L* **17** # 614

Palkert, Thomas Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

All impedance values should be 92.5 ohms

SuggestedRemedy

Change reference impedance to 92.5 ohms

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **176C** *SC* **176C.6.2** *P* **723** *L* **18** # 66

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The reference impedance for measurement should align with the test fixture reference.

SuggestedRemedy

Change line to:

The reference impedance for differential specifications is 92.5 ohms. The reference impedance for common-mode specifications is 23.125 ohms.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **176C** *SC* **176C.6.3** *P* **723** *L* **39** # 504

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *(Electrical) AC CM*

The max value of Low Frequency AC common mode noise is 30mV for KR but 32mV for C2C with a tighter Block Error ratio requirement. There isn't a reasonable justification for this difference.

SuggestedRemedy

Change the C2C value to 30mV in table 176C-2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #506.

Cl **176C** *SC* **176C.6.3.1** *P* **724** *L* **35** # 462

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket) ILT*

There is ILT has a Type E1 not type E.

SuggestedRemedy

Change Type E to Type E1.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #109.
[Editor's note: Changed subclause/page from 176C.5.3.1/706 to 176C.6.3.1/724]

Cl **176C** *SC* **176C.6.3.1** *P* **724** *L* **35** # 109

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Electrical) (bucket) ILT*

There is no Type E defined in Annex 178B

SuggestedRemedy

Change: "Type E"
to: "Type E1"

Response *Response Status* **W**

ACCEPT.

Cl **176C** *SC* **176C.6.3.5** *P* **726** *L* **18** # 606

Palkert, Thomas Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The C2C specification should use 92.5 ohm impedance for transmitter and receiver ERL

SuggestedRemedy

add line in Table 176C-3 to specify 92.5 ohm impedance

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **176C** *SC* **176C.6.3.5** *P* **726** *L* **38** # 62

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

ERL impedance should be aligned to Rd and 179B.

SuggestedRemedy

Add line:
The reference differential impedance for the test fixture ERL computation shall be 92.5 ohms.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **176C** *SC* **176C.6.4.2** *P* **727** *L* **9** # 535

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **R** *(Electrical) C2C channel*

There isn't a minimum loss specified for the C2C channel. Inserting the the minimum channel loss from the KR interference tolerance test isn't appropriate.

SuggestedRemedy

Consider whether using the same minimum loss used for the interference tolerance test is appropriate. If so add to 176C.7.2. The recommended minimum channel insertion loss is 13dB.
On page 727 line 9 replace "using a channel with the minimum insertion loss specified in 178.9.3.4" with "using an amplitude tolerance test channel" Add a sentence to the end of the paragraph. The loss of the amplitude tolerance test channel including the package loss of the compliant transmitter used in the test is equal to the Test 1 loss in table 176C-5 .
If not then replace "using a channel with the minimum insertion loss specified in 178.9.3.4" with "using a minimal loss channel"

Response *Response Status* **U**

REJECT.

The suggested remedy includes an option that disconnects the minimum loss of the channel from the low-loss channel used in the receiver interference tolerance test.

There was general agreement to this direction but a detailed proposal is required. Future contribution in this area is encouraged.

Cl **176C** *SC* **176C.6.4.5.3** *P* **729** *L* **48** # 532

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

The C2C receeiver should be able to determine whether pre-coding is used.

SuggestedRemedy

Change "test transmitter equalizer using the ILT function" to "test transmitter equalizer and precoder using the ILT function" Also for KR on page 368 line 22

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #534.

Cl **176C** *SC* **176C.7** *P* **731** *L* **13** # 536

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *(Electrical) C2C channel*

It isn't clear what the channel includes. (including where the Ildd is measured from).

SuggestedRemedy

Change the description in table to "Maximum insertion loss from Tp0d to Tp5d, ILdd, at 53.125 GHz (recommended)" (as used for KR).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **176C** *SC* **176C.7** *P* **731** *L* **13** # 482

Healey, Adam — Broadcom, Inc.

Comment Type **T** *Comment Status* **A** *(Electrical) C2C channel*

There is potential confusion about what channel insertion loss covers. While 176C.3 defines the "channel" to be from TP0d to TP5d, the input to the COM calculation is the portion between TP0 and TP5 and the input to the ERL calculation is a measurement at TP0 or TP5.

SuggestedRemedy

To eliminate the possibility of any confusion, state the channel insertion loss recommendation is for TP0d to TP5d (similar to what is done in Table 178-11).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #536.

Cl **176C** *SC* **176C.7.1** *P* **733** *L* **4** # 259

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, quantization noise parameters should be added to Table 176C-8.

SuggestedRemedy

Add two quantization noise parameters with suggested values to the table. Please refer to slide 17 of the accompanying document for the proposed change.
Also, see shakiba_3dj_elec_01_250626.pdf.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **176C** *SC* **176C.7.1** *P* **733** *L* **10** # 238

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **R** *ctrical) Reference impedance*

Adjust COM voltage to 46.25 ohms measurement reference.

SuggestedRemedy

Change
A_vtō 0.415
A_fetō 0.415
A_netō 0.610

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #237.

Cl **176C** *SC* **176C.7.1** *P* **733** *L* **46** # 258

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, an updated value for One-sided noise spectral density in Table 176C-8 is needed.

SuggestedRemedy

Change One-sided noise spectral density parameter value in the table (line 46). Please refer to slide 17 of the accompanying document for the proposed change.
Also, see shakiba_3dj_elec_01_250626.pdf.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **176C** *SC* **176C.7.1** *P* **734** *L* **9** # 540

Levin, Itamar — Altera corp.

Comment Type **T** *Comment Status* **R** *Electrical) (bucket) COM FFE*

The table says the highest allowed tap index is 56 while footnote (b) says the latest post-cursor position for a floating tap is 50. Given that the number of flating taps per group is 4, there is a discerpency between the comment and highest allowed tap index

SuggestedRemedy

either fix the comment and highest index to be 54 or add clarifying text in the comment explaining the aparent discerpency.

Response *Response Status* **C**

REJECT.
Tap index 1 is the first precursor tap, and there are 5 precursor + 1 cursor (main) taps.
Thus tap index 56 is the 50th postcursor tap, as in the footnote.
See <https://ieee802.org/3/dj/public/25_01/ran_3dj_01_2501.pdf#page=24>.

Cl **176C** *SC* **176C.7.3** *P* **734** *L* **43** # 607

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The C2C specification should use 92.5 ohm impedance for channel ERL

SuggestedRemedy

add line in Table 176C-9 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **176D** *SC* **176D.2** *P* **741** *L* **5** # 41

Liu, Cathy — Broadcom Inc.

Comment Type **E** *Comment Status* **R** *(Electrical) BER_added*

The BER_added is defined as 2.681 x 10 ^ -4. It is three-bit decimal. Other places in the document are two-bit decimal.

SuggestedRemedy

Change to 2.68 x 10 ^ -4

Response *Response Status* **C**

REJECT.
The current value 2.681e-4 was adopted by the response to comment #143 against D1.1. See <https://www.ieee802.org/3/dj/comments/D1p1/8023dj_D1p1_comments_final_clause.pdf#page=42>. Justification for the value can be found in <https://www.ieee802.org/3/dj/public/24_09/brown_3dj_04_2409.pdf#page=7>.
(Note that the comment above is listed as being against Annex 176E, but following reordering of annexes it is the current Annex 176D)

The BER_added values for AUIs are provided with three-digit decimal fraction (resolution of 1e-7) because they are the difference between the KP4 FEC random BER correction capability (calculated as 2.921e-4, to a resolution of 1e-7) and the AUI random BER allocation. Since the AUI random BER allocation is in the order of 1e-6, the resolution has a larger effect on calculation of block error ratio for the AUIs, compared to PMDs.

The same argument applies to this comment (C2M) and comment #39 (C2C).

Cl **176D** *SC* **176D.6.3** *P* **745** *L* **16** # 506

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *(Electrical) AC CM*

The module AC common-mode input tolerance is 80mV max full band and 32mV for the low frequency. The allowed host output AC common-mode full band is however 85mV max (and 30mV max for the low frequency). The host output value should not be higher than the module input tolerance full band, and there isn't a reason why the module should tolerate more than the host outputs at low frequency.

SuggestedRemedy

Change the full band AC common-mode output voltage for the host from 85mV to 80mV. Consider also changing the low frequency from 30mV to 32mV to match the module tolerance.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
There are several comments related to the AC common mode voltage.

The CRG reviewed slides 3-6 of <https://www.ieee802.org/3/dj/public/25_07/ran_3dj_01a_2507.pdf>.

Implement the changes suggested on slide 6 of ran_3dj_01a_2507 with editorial license.

Cl **176D** *SC* **176D.6.4** *P* **746** *L* **34** # 414

Mi, Guangcan — Huawei Technologies Co., Ltd

Comment Type **TR** *Comment Status* **A** *(Electrical) SNDR*

As Ali's contribution ghiasi_3dj_02b_2505, dSNDR is a complicated parameter. Rich's contribution further proposed to set a set of SNDR_ref values.

For module vendors, both SNDR and dSNDR are newly introduced, and dependent on the IL at the host side. It is not practical for the module vendors to test for all the IL variations.

SuggestedRemedy

The AUI C2M methodology affects both the SERDES/euqipment and the optical module community. The newly introduced parameters need to be open for consideration from both sides, and find consensus in simplfying the measurements.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #481.

Cl **176D** *SC* **176D.6.5** *P* **747** *L* **12** # 354

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **T** *Comment Status* **A** *(Electrical) AC CM*

In 802.3ck VCM(LF) was 32 mV which is more than 2x larger than limit in the DJ draft at TP4 with only 15 mV

SuggestedRemedy

Given that Module/TP4 would be the larget source of VCM(LF), recommend increasing to 20 mV

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #506.

Cl **176D** *SC* **176D.6.5** *P* **747** *L* **13** # 507

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *(Electrical) AC CM*

The Host AC common-mode input tolerance is 80mV max full band . The allowed module output AC common-mode full band is however only 60mV max . There isn't a reason why the host should tolerate more than the module outputs.

SuggestedRemedy

Change the host AC common-mode input tolerance full band from 80mV to 60mV

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #506.

Cl **176D** *SC* **176D.7.1** *P* **750** *L* **17** # 261

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, quantization noise parameters should be added to Table 176D-7.

SuggestedRemedy

Add two quantization noise parameters with suggested values to the table. Please refer to slide 18 of the accompanying document for the proposed change.
Also, see shakiba_3dj_elec_01_250626.pdf.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **176D** *SC* **176D.7.1** *P* **751** *L* **23** # 260

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, an updated value for One-sided noise spectral density in Table 176D-7 is needed.

SuggestedRemedy

Change One-sided noise spectral density in Table 176D-7 (page 751, line 23) value.
Please refer to slide 18 of the accompanying document for the proposed change.
Also, see shakiba_3dj_elec_01_250626.pdf.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **176D** *SC* **176D.7.2** *P* **748** *L* **51** # 350

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucket)*

The partial channel is only needed for cable assembly CR and not for C2M which has the complete S-Parameters

SuggestedRemedy

Partial channel not need for C2M COM and should be removed

Response *Response Status* **W**

REJECT.
The CRG has previously considered similar comments, the recent one being comment #151 against D1.4 (see <https://www.ieee802.org/3/dj/comments/D1p4/8023dj_D1p4_comments_final_clause.pdf#page=27>, which was rejected.
As noted in the response to that comment, the host channel model, which is used in dSNDR (176D.8.7) and in host interference tolerance test calibration (176D.8.12.2), includes the partial channel (subject of this comment) and physical MCB and HCB, (see, e.g., Figure 176D-7b).
The partial host channel constitutes most of the 32 dB IL which is the consenus IL budget for the C2M channel. Therefore, it should not be removed.
This comment does not provide any information that was not included in previous comments.

Cl **176D** *SC* **176D.7.2** *P* **749** *L* **34** # 609

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

All impedance values should be 92.5 ohms

SuggestedRemedy

Change COM Impedance to 92.5 ohms

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **176D** *SC* **176D.7.2** *P* **749** *L* **51** # 140

Hidaka, Yasuo — Credo Semiconductor, Inc.

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

tau^(h) value of 5.97x10^(-3) in Table 176D-6 seems a typo of 5.79x10^(-3). It is 5.79x10^(-3) in Table 179-16 and lim_3dj_01a_2409, slide 2.

SuggestedRemedy

Change 5.97x10^(-3) to 5.79x10^(-3).

Response *Response Status* **C**

ACCEPT.

Cl **176D** *SC* **176D.7.2** *P* **750** *L* **23** # 239

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **R** *ctrical) Reference impedance*

Adjust COM voltage to 46.25 ohms measurement reference.

SuggestedRemedy

Change
A_vt̄ō 0.415
A_fet̄ō 0.415
A_net̄ō 0.611

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #237.

Cl **176D** *SC* **176D.8.1** *P* **751** *L* **50** # 358

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucket)*

Differential and common-mode signals are not defined in 93.8.1.3, just the figure is used for level definition.

SuggestedRemedy

Replace with, Differential and common-mode signal levels definition is given by 93.8.1.3.

Response *Response Status* **W**

REJECT.
Contrary to the statement in the comment, the differential and common-mode signals are explicitly defined in the first paragraph of 93.8.1.3:
"The differential output voltage v_di is defined to be SLi<p> minus SLi<n>. The common-mode output voltage v_cmi is defined to be one half of the sum of SLi<p> and SLi<n>".

Cl **176D** *SC* **176D.8.1** *P* **752** *L* **13** # 359

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *(Electrical) AC CM*

The VCM(LF, FB) is measured at probability of 1E-5, in DJ it is tighten to P=1E-7

SuggestedRemedy

Common mode is bigger issue at 200G compared to 100G, with tighten probibility may result in failures. Change P to 1E-5 two places

Response *Response Status* **C**

REJECT.
The definition of peak-to-peak with a probability of 1e-7 was adopted by comment #82 against D1.2, see < https://www.ieee802.org/3/dj/comments/D1p2/8023dj_D1p2_comments_final_clause.pdf#page=21>, following presentations <https://www.ieee802.org/3/dj/public/24_11/ran_3dj_05a_2411.pdf> and <https://www.ieee802.org/3/dj/public/24_09/ran_3dj_02a_2409.pdf>.
As noted in these contribution, common-mode noise can cause correlated errors in receivers and degrade the post-FEC performance. Therefore, the peak should be specified at a probability much lower than the BER allocation assuming uncorrelated errors.
The suggested remedy is based on an assumption that this specification may result in failures. However, no data has been provided to show that such high CM noise occurs in transmitters and that receivers can cope with it.

Cl **176D** *SC* **176D.8.2** *P* **752** *L* **29** # 142

Hidaka, Yasuo — Credo Semiconductor, Inc.

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

ERL definition in 93A.5 needs a parameter M that is not defined in Table 176D-8, because M is not used in COM definition in Annex 178A.

SuggestedRemedy

Add M to Annex 178A in the same way as Annex 93A and to all related tables that refer Annex 178A.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Annex 178A does not refer to 93A.5, so it does not need a value for M.
M should be provided by a clause that invokes 93A.5, along with all other parameters. In previous clauses M was part of the COM parameter tables (with value 32), but in this project it is not. Therefore, it needs to be added, preferably as an ERL parameter.

Add a row for "Number of samples per unit interval", M, with value 32, in the following tables:
Clause 178: Table 178–7, Table 178–8, Table 178–14
Clause 179: Table 179–9, Table 179–14
Annex 176C: Table 176C–3, Table 176C–9
Annex 176D: Table 176D–8
Annex 179B: Table 179B–1
[CC 178, 179, 176C, 176D, 179B]

Cl **176D** *SC* **176D.8.2** *P* **752** *L* **44** # 608

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The C2M specification should use 92.5 ohm impedance for TP1a ERL

SuggestedRemedy

add line in Table 176D-8 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **176D** *SC* **176D.8.6** *P* **753** *L* **36** # 541

Levin, Itamar — Altera corp.

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucket) presets*

There is no preset that has a different than 0 precursor c(1). Also - the initialize and preset 6 are exactly the same.

SuggestedRemedy

Consider a preset with c(1) <> 0. this may help with CDR locking on some channels. Also consider to remove preset 6 or add a comment in this clause explaining why it was added

Response *Response Status* **W**

REJECT.
Preset #6 was added by the response to comment #125 against D1.3, see <https://www.ieee802.org/3/dj/comments/D1p3/8023dj_D1p3_comments_final_clause.pdf#page=69>, and the related presentation <https://www.ieee802.org/3/dj/public/25_01/simms_3dj_01a_2501.pdf>. The motivation for adding "initialize" as a separate row is explained in slides 12-20 the related presentation <https://www.ieee802.org/3/dj/public/25_01/ran_3dj_01_2501.pdf>. For AUIs "initialize" is identical to preset 6, but for PMDs it is identical to preset #1. These presets can be requested using the ILT protocol, e.g. to return to the initial value, without having "initialize" as a separate request.

The defined presets follow earlier PAM4 specifications (clause 136, used for 50 and 100 Gb/s) that had zero postcursor c(1) for all presets.
Note that changes to c(1) can be requested using ILT (which has an initial PAM2 pattern that may be used for CDR locking).

The comment does not provide sufficient justification to support the suggested remedy.
The proposed change does not contain sufficient detail to implement.

Cl **176D** *SC* **176D.8.7** *P* **754** *L* **20** # 355

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(Electrical) SNDR*

The dSNDR procedure for host is not clear as some some of the paragraph are for determination of reference SNDR but the last paragraph is for actual measurement of DUT SNDR.

SuggestedRemedy

Here are sugestions:
- Please separate the measurement of reference channel SNDR from measurement of DUT SNDR
- After definition of reference SNDR "calculate reference SNDR"
- In the 2nd part clarly identify this procedure is for measurement of DUT SNDR add to sentense "...of 6 ps is used for measurement of DUT SNDR"
- Then last step is dSNDR=DUT SNDR - Ref SNDR

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #481.

Cl **176D** *SC* **176D.8.7** *P* **754** *L* **34** # 357

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *(Electrical) SNDR*

The dSNDR procedure for DUT measurement is missing

SuggestedRemedy

The module inputs at TP1 on each lane are driven by asynchronous signals created by PRBS31Q or
PCS data, with transmit equalization (see 176D.8.6) set to preset 1, and calibrated at the generator
output with target maximum steady-state voltage as specified in Table 176D–3 and transition time of
6 ps is used for measurement of DUT SNDR.

Response *Response Status* **W**

REJECT.
The addition of asynchronous signals at the host input in host SNDR measurement was added in response to comment #423 against D1.3, see <https://www.ieee802.org/3/dj/comments/D1p3/8023dj_D1p3_comments_final_clause.pdf#page=39>. The comment noted that the situation is different for module SNDR, since the output signal is stronger and the input interferer signals are weaker, and thus did not suggest adding the same requirement in this case. In consideration of that comment, the additional signals were added only to the host output SNDR measurement.

In this comment, the suggested remedy is to add the same signals for module SNDR measurement.

The comment but does not provide sufficient justification to support the suggested remedy.

Cl **176D** *SC* **176D.8.7** *P* **754** *L* **34** # 356

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(Electrical) SNDR*

The dSNDR procedure for module is not clear as some some of the paragraph are for determination of reference SNDR but the last paragraph is for actual measurement of DUT SNDR.

SuggestedRemedy

Here are sugestions:
- Please separate the measurement of reference channel SNDR from measurement of DUT SNDR
- After definition of reference SNDR "calculate reference SNDR"
- In the 2nd part clarly identify this procedure is for measurement of DUT SNDR
- Then last step is dSNDR=DUT SNDR - Ref SNDR

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #481.

Cl **176D** *SC* **176D.8.7** *P* **754** *L* **36** # 542

Levin, Itamar — Altera corp.

Comment Type **T** *Comment Status* **A** *(Electrical) SNDR*

no reference / example test-fixture like in the previous annex 163B, that meets the requirements for TP0

SuggestedRemedy

can we add an example rest-fixture annex for 200G similar to 163B with the COM values to serve as a reference for dVf, dSNR, etc'?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The suggested remedy addresses dSNDR and dvf.
The response to comment #481 replaces dSNDR with SNDR, so an example of a reference is not required. dvf is not a specification in Annex 176D.

Resolve using the response to comment #481.

Cl **176D** *SC* **176D.8.12.4** *P* **758** *L* **35** # 533

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

The C2M receeiver should be able to determine whether pre-coding is used.

SuggestedRemedy

Change "PRBS31Q pattern" to "PRBS31Q pattern with the precoder enabled or disabled as the receiver would select using the ILT protocol"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #534.

Cl **177** *SC* **177.1** *P* **327** *L* **11** # 241

Gorshe, Steve — Microchip Technology

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The term "SIL" appears in this figure. It is defined in some figures as meaning "Signal Indication Logic" but not in this figure and others.

SuggestedRemedy

Since SIL is used in mutliple figures without consistent definition, I recommend adding SIL to the abbreviation list in clause 1.5

Response *Response Status* **C**

ACCEPT.
[Editor's note: CC: 1, 177]

Cl **177** *SC* **177.1.1.3** *P* **326** *L* **6** # 583

Nowell, Mark — Cisco

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Unlike Clause 184.1.3 which summarizes the functions of that clauses inner FEC, Clause 177.1.3 doesn't include the basic detail that it is a BCH(128,120) encoding/decoding.

For readability and consistency these two subclauses should provide similar information to the reader.

SuggestedRemedy

In clause 177.1.3, include the description that that the inner FEC encoding for Clause 177 is BCH(128,120)

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.1.3** *P* **326** *L* **7** # 82

Bruckman, Leon — Nvidia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The convolutial interleaver is "a convolutional interleaver"

SuggestedRemedy

Change: "using the convolutional interleaver" to: "using a convolutional interleaver"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.2** *P* **328** *L* **14** # 182

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

It would be better to not list the specific PMDs here and create a potential need to regularly update this text if new PHYs are added that use this inner FEC.

SuggestedRemedy

Replace "The number of parallel streams, n, is 1 for 200GBASE-DR1-2, 2 for 400GBASE-DR2-2, 4 for 800GBASE-DR4-2, 800GBASE-FR4, and 800GBASE-LR4, and 8 for 1.6TBASE-DR8-2."
with
"The number of parallel streams, n, is 1 for 200GBASE-R PHYs, 2 for 400GBASE-R PHYs, 4 for 800GBASE-R PHYs, and 8 for 1.6TBASE-R PHYs."

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.2** *P* **328** *L* **21** # 83

Bruckman, Leon — Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Different lenguage used in adjacent paragraphs. In the first paragraph: ", the tx_symbol parameters are undefined." and in the next paragraph: "the corresponding rx_symbol parameters on all lanes are unspecified.

SuggestedRemedy

Use similar lenguage in both paragraphs.
Make same change in the two last paragraphs of 177.3

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Use the same language as rx side.

Cl **177** *SC* **177.3** *P* **328** *L* **45** # 183

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

Clause 182 is not the only PMD that is used with this inner FEC, so the service interface below the Inner FEC is not limited to the PMD service interface in 182.3. It could also be the interface in 183.3. Rather than enumerating all the clauses (which would create a potential need to regularly update the clause), a more generic statement can be used.

SuggestedRemedy

Change "the PMD service interface defined in 182.3" to "the PMD service interface for the PHY".

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.2** *P* **331** *L* **29** # 184

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Awkward grammer in "The data from deskwed PMA lane is fed…"

SuggestedRemedy

Change to "Data from the deskwed PMA lane is fed…"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change:
"The data from deskewed PMA lane is fed…"
to:
"Data from the deskewed PMA lane is fed…"

Cl **177** *SC* **177.4.2** *P* **331** *L* **30** # 84

Bruckman, Leon
Nvidia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Missing word

SuggestedRemedy

Change: "The data from deskewed PMA lane" to: "The data from a deskewed PMA lane"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #184.

Cl **177** *SC* **177.4.5** *P* **333** *L* **16** # 697

Dawe, Piers
Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

is most naturally defined

SuggestedRemedy

Clean up

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Remove "most naturally".

Cl **177** *SC* **177.4.5** *P* **333** *L* **18** # 698

Dawe, Piers
Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

alpha

SuggestedRemedy

Define

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Add definition for alpha as "alpha is a primitive element in Galois Field GF(2^7)."

Cl **177** *SC* **177.4.5** *P* **333** *L* **24** # 700

Dawe, Piers
Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

T

SuggestedRemedy

Define

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Add definition for T : " the superscript "T" denotes a matrix transpose operator"

Cl **177** *SC* **177.4.5** *P* **334** *L* **4** # 705

Dawe, Piers
Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

generator matrix vs. Generation matrix - confusingly similar names

SuggestedRemedy

Rename one

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Rename to "generator matrix".

Cl **177** *SC* **177.4.7** *P* **334** *L* **37** # 185

Huber, Thomas
Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

Figure 177-7 is a bit confusing. The 1024-bit pad is the equivalent number of bits as "8x Inner FEC codewords", but of course is not that, it's padding bits as described by the text and subclauses under the figure. More generatlly, the use of "8x" in the figure is not appropriate, as there is no multiplication going on. In the text under the horizontal brace (8704 Inner FEC codewords), the intent is that there are 1088 blocks of 8 Inner FEC codewords (a total of 8704 codewords), but this could easily be misinterpreted by a careless reader as 8704 blocks of 8 Inner FEC codewords It would also be helpful to explicitly indicate 1088 blocks, as that would more clearly relate back to the text about the 1088/1089 ratio.

SuggestedRemedy

In the pad blocks, replace "8x Inner FEC codewords" with "1024 bits". In the other blocks, change "8x" to "8". In the text under the brace, add another line that says "(1088 blocks of 8 inner FEC codewords)".

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.4.7.3** *P* **336** *L* **4** # 85

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

The bit pair interleaving function for the pad field is not described.

SuggestedRemedy

Add section decribing the bit-pair interleaving fucntion shown in figure 177-8. Something in the lines of: "After Inner FEC encoding, the eight pad flows of Inner FEC codewords shall be multiplexed together as decribed in 177.4.6".
Also refer to comment against the figures in Clause 177 vs the ones in Annex 177A regarding the pad insertion function liocation.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Add subclause 177.4.7.4, describing the bit-pair interleaving as "The 8 pad codewords are multiplexed together as described in 177.4.6"

Cl **177** *SC* **177.4.8.2** *P* **336** *L* **15** # 186

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **R** *(Logic) (bucket)*

If the precoder is configured either based on ILT or is "set as required by the implementation", what is the purpose of having the set of "precoder_{tx|rx}_{in|out}_enable_i" variables to enable and disable it for each lane/direction? It doesn't sound like the user has any need to control these settings.

SuggestedRemedy

Either remove the variables entirely, or treat them as status variables that report the configuration if there is some value in the user knowing what the configuration is Or, if the intent in the case that ILT is not being used is that the user needs to figure out whether to enable the precoder, make that more clear.

Response *Response Status* **C**

REJECT.

When training is disabled, the user needs to configure the precoder on both sides to the same value, depending on the implementation. The language used here is consistent with similar language in clause 120 and other clauses, and is intentionally vague to allow for a variety of implementation choices.

[Editor's note: CC: 176, 177]

Cl **177** *SC* **177.5.1** *P* **336** *L* **36** # 187

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The last sentence is a comma splice.

SuggestedRemedy

Change to read: "The hard-decision PAM4 decoding function…. in Figure 177.2. The soft-decision PAM4 decoding…"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.2** *P* **337** *L* **9** # 86

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

The pad field is not used to frame the data stream in the state diagram shown in Figure 177-10.

SuggestedRemedy

Change: "The eight codewords inserted as pad (see 177.4.7) are used to frame the data stream and are then removed before the received data is processed further."
To: "The eight codewords inserted as pad (see 177.4.7) are then identified and removed before the received data is processed further."

Response *Response Status* **W**

ACCEPT.

Cl **177** *SC* **177.5.2** *P* **337** *L* **19** # 281

Ren, Hao
Huawei

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

The definition of the candidate location and the synchronization location is not clear.

The candidate location is the inner FEC codeword boundary of a valid set of codewords. The candidate location is regarded as the synchronization location when the candidate location is confirmed valid for a second window of 128b-bit blocks.

SuggestedRemedy

Change:
The synchronization process searches for a valid set of codewords in a window of 128-bit blocks, confirms the candidate location is valid for a second window of 128b-bit blocks and then monitors that the synchronization location continues to be valid during operation.
to:
[A]: The synchronization process searches for a valid set of codewords in a window of 128-bit blocks. The boundary of these codewords is marked as candidate location, which is confirmed as the synchronization location if it is valid for a second window of 128b-bit blocks. The synchronization process contiuously validates the synchronization location during operation.
[B]: The synchronization process searches for a valid set of codewords in a window of 128-bit blocks, marking the boundary of these codewords as candidate location, confirms the candidate location as sychronization location by validating for a second window of 128b-bit blocks, and then monitors that the synchronization location continues to be valid during operation.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Breaking the sentence can improve clarity. Use language as follows:
"The synchronization process searches for a valid set of codewords in a window of 128-bit blocks, marking the boundary of these codewords as a candidate location. A candidate location is confirmed as the synchronization location if it is valid for a second window of 128b-bit blocks. The synchronization process continuously validates the synchronization location during operation."

Cl **177** *SC* **177.5.2** *P* **337** *L* **20** # 188

Huber, Thomas
Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

"128b-bit blocks" has a stray b

SuggestedRemedy

Change to "128-bit blocls"

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.5** *P* **338** *L* **31** # 568

Nicholl, Shawn
AMD

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Current text: "The decoder is expected to correct all codewords with one bit error. It may also be able to correct ..."

The current sentence, although containing no language that indicates a mandatory requirement, might be interpretted by readers as a requirement.

It is preferred to clarify the language as improved soft-decision decoder performance (gain) may be obtained by an implementation that is not bound by a rule to correct all codewords with one bit error

SuggestedRemedy

Referring to 802.3-2022 Sub-Clause "1.1.6 Word usage", perhaps the word "should" provides sufficient clarity.

Proposed text: "The decoder should correct all codewords with one bit error. It may also be able to correct ..."

Response *Response Status* **C**

ACCEPT.

Cl **177** *SC* **177.5.5** *P* **339** *L* **11** # 87

Bruckman, Leon
Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

There is no mention regarding when are the 8 parity bits removed

SuggestedRemedy

Add to the end of the section: "Parity bits are then removed from each Inner FEC codeword"

Response *Response Status* **W**

ACCEPT.

Cl **177** *SC* **177.6.1.1** *P* **339** *L* **44** # 89

Bruckman, Leon
Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Missing "the"

SuggestedRemedy

Change: "is processed by Inner FEC sublayer" to: "is processed by the Inner FEC sublayer"

Response *Response Status* **W**

ACCEPT.

Cl **177** *SC* **177.6.2.3** *P* **340** *L* **41** # 90

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **R** *(Logic) (bucket)*

This checker is not shown in Figure 177-2.

SuggestedRemedy

Add the PRBS31 encoded by Inner FEC test pattern checker location in Figure 177-2.

Response *Response Status* **W**

REJECT.
By the definition of 177.6.2.3, this checker is not part of 177. It is in the PMA above the Inner FEC.

Cl **177** *SC* **177.10** *P* **346** *L* **47** # 571

Nicholl, Shawn AMD

Comment Type **E** *Comment Status* **R** *(Logic) (bucket)*

In the "Status variable" column of the "Inner_FEC_codeword_error_bin_k (Inner FEC lane 0)" row of "Table 177-8 -- Inner FEC status variables and MDIO mapping", it is not obvious what is meant by 'k'.

Same issue is observed for rows "Inner_FEC_codeword_error_bin_k (Inner FEC lane 1)" through "Inner_FEC_codeword_error_bin_k (Inner FEC lane 7)".

SuggestedRemedy

Propose that in the "Status variable" column of the "Inner_FEC_codeword_error_bin_k (Inner FEC lane 0)" row of "Table 177-8-Inner FEC status variables and MDIO mapping" add text "(k = 0 to 4)".

Propose that in each of rows "Inner_FEC_codeword_error_bin_k (Inner FEC lane 1)" through "Inner_FEC_codeword_error_bin_k (Inner FEC lane 7)" also add the text "(k = 0 to 4)".

Response *Response Status* **C**

REJECT.
In Table 177-8 there is a reference to the defintion of the status variable "Inner_FEC_codeword_error_bin_k" (to subclause 177.5.5), and this definition defines the range for k.

Cl **178** *SC* **178.1** *P* **357** *L* **1** # 91

Bruckman, Leon Nvidia

Comment Type **ER** *Comment Status* **R** *(Electrical) (bucket)*

Table 178-4 footnotes are in the next page

SuggestedRemedy

Make sure the footnotes of Table 178-4 are in the same page with their correspondent table.

Response *Response Status* **W**

REJECT.
The placement of tables and footnotes may change in future drafts due to various edits. The publication editor will address such changes for the final version.

Cl **178** *SC* **178.2** *P* **357** *L* **5** # 638

Li, Mike Altera (An Intel compnany)

Comment Type **T** *Comment Status* **R** *:lectrical) (bucket) BERadded*

Refer to figure 174A-5,
1.) BERadded is the BER contribution outside of the measured sublayer link.
2.) Measured sublayer link is PCS-to-PCS including PMD and FEC. Both TX-FEC and RX-FEC must be included in the PHY-based measurement. To use FEC decoder, the incoming signal must be encoded (compared with the incoming signal does not need to be encoded to use PMA-based block error measurement).
3.) May the measured link have xMII extender outside this sublayer link (its BER budget is not 8e-6 according to CL-174A.4).
4.) with Table 174A-2, table 174A-3, xMII extender (if used) is not part of CER < 1.45e-11 spec.
5.) Considering all of these, the BERsdded value for CL-178.2 should not be simple 8e-6. Instead, it should be 8e-6 * Number_of_C2C_SubLayerLink outside of the measured sublayer link between the two ends MACs.

SuggestedRemedy

change the BERsdded value from 8e-6 to 8e-6 * Number_of_C2C_SubLayerLink outside of the measured sublayer link between the two ends MACs.

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #639.

Cl **178** *SC* **178.7** *P* **359** *L* **23** # 300

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

There are no "FEC lanes". This is likely a carry-over from 802.3ck for 100GBASE-KR1 which indeed does have FEC lanes.

SuggestedRemedy

Change "PCS or FEC" to "PCS".

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.8.9** *P* **361** *L* **13** # 416

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **A** *(Common) ILT local_pattern*

In order to bring up a link that includes multiple ISLs, the functionality of ILT as specified by Annex 178B (specifically Figure 178B–7 and Figure 178B–8) is required across ISLs.

In PMDs that have a training protocol but it's disabled, the "quiet" and "local pattern" modes are the method of communicating the RTS to the peer. However, the local pattern is currently not defined.

Apples to the multiple ILT function subclauses of the PMD functional specifications in clauses 178 through 182 (which have an SM-PMA above the PMD)

SuggestedRemedy

Specify that PRBS31Q (which may be generated by the PMA, see 176.7.4.2) is the pattern used when mr_training_enable is false and tx_mode has the value local_pattern (see 178B.14.3.1).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following related contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_07/ran_3dj_02_2507.pdf

Implement slide 10 of ran_3dj_02_2507 and ensure that similar requirements for the C2M and C2C AUI are explicit as well.

Implement with editorial license.

Cl **178** *SC* **178.8.9** *P* **361** *L* **25** # 305

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *(Electrical) (bucket)*

Regarding "control the transmitter on each lane of the MDI". It's really controlling the PMD transmitter not the MDI and to be clear it is controlling the PMD transmitter only in response to requests from the link peer interface.

SuggestedRemedy

Change "control the transmitter output on each lane of the MDI" to "control the PMD transmitter output on each lane based on requests from the peer interface".
Implement similarly in 179.8.9, 176C.3, and 176D.3.

Response *Response Status* **W**

ACCEPT.

Cl **178** *SC* **178.8.9** *P* **361** *L* **26** # 190

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *rical) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 178.8.9 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **178** *SC* **178.9.1** *P* **361** *L* **43** # 63

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The reference impedance for measurement should align with the test fixture reference.

SuggestedRemedy

Change line to:

The reference impedance for differential specifications is 92.5 ohms. The reference impedance for common-mode specifications is 23.125 ohms.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

There are multiple comments on this topic.
The CRG reviewed slides 7-12 of
<https://www.ieee802.org/3/dj/public/25_07/ran_3dj_01a_2507.pdf>.

Implement the recommended changes on slide 12 of ran_3dj_01a_2507 with editorial license.

Cl **178** *SC* **178.9.1** *P* **361** *L* **43** # 611

Palkert, Thomas Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

All impedance values should be 92.5 ohms

SuggestedRemedy

Change reference impedance to 92.5 ohms

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **178** *SC* **178.9.1.2** *P* **363** *L* **32** # 616

Palkert, Thomas Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The KR specification should use 92.5 ohm impedance for TP0v test fixture

SuggestedRemedy

add line in Table 178-7 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **178** *SC* **178.9.2** *P* **361** *L* **48** # 641

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket)*

The sentence states that specifications must be met at TP0v, but TP0v has not yet been defined.

SuggestedRemedy

Change the sentence to "The transmitter on each lane shall meet the specifications at TP0v (see 178.9.2.1) given …"

Response *Response Status* **W**

ACCEPT.

Cl **178** *SC* **178.9.2.1** *P* **362** *L* **49** # 642

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket)*

"measurements of the transmitter are made at the output of a test fixture (TP0v) as shown in Figure 178–3 and described in Annex 163A" reads like the test fixture is described in Annex163A, which it is not.

SuggestedRemedy

Change to "the transmitter is measured using the methodology described in Annex 163A at the output of a test fixture (TP0v) as
shown in Figure 178–3."

Response *Response Status* **W**

ACCEPT.

Cl **178** *SC* **178.9.2.1** *P* **362** *L* **49** # 644

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket)*

"An example test fixture is described in Annex 163B." Annex 163B does not describe an example test fixture. A description of an example test fixture would be a drawing of a physical test fixture, or perhaps a description of a possible implementation of an example fixture. Annex 163B gives example electrical characteristics for a test fixture for which reference values can be calculated. (I am not certain my interpretation is correct and would like clarification.)

SuggestedRemedy

Change to " Annex 163B gives example electrical characteristics of a test fixture for which reference values can be calculated."

Response *Response Status* **W**

ACCEPT.

Cl **178** *SC* **178.9.2.1.2** *P* **363** *L* **24** # 595

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The ERL for a test fixture at TP0v is defined without a reference impedance. The implied reference impedance is inferred from 178.9.1, 100-ohm. The use of a 100-ohm reference impedance for ERL is not consistent throughout D2P0.

SuggestedRemedy

Add definition of a 92.5-ohm reference impedance for the ERL computation, consistent with Annex179B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **178** *SC* **178.9.2.1.2** *P* **363** *L* **25** # 307

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **R** *(Electrical) (bucket) ERL*

It appears that to measure ERL properly the test fixture would have to be terminated at TP0 with an appropriate impedance or reflections from the device under test would have to be gated out.

SuggestedRemedy

Provide appropriate guidance for measuring the ERL at TP0v.

Response *Response Status* **C**

REJECT.
The description is consistent with the initial specification of test fixture ERL in 163.9.2.1.2. Either of the methods suggested in the comment, and possibly others, could be used by test engineers to verify the quality of the test fixture. The standard does not prescribe the test method.
The suggested remedy does not provide sufficient detail to implement.

Cl **178** *SC* **178.9.2.1.2** *P* **363** *L* **45** # 59

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

ERL impedance should be aligned to Rd and 179B.

SuggestedRemedy

Add line:
The reference differential impedance for the test fixture ERL computation shall be 92.5 ohms.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **178** *SC* **178.9.2.2** *P* **364** *L* **3** # 308

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

As is done for other parameters, it would be helpful to follow "difference ERL" with variable name "dERL".

SuggestedRemedy

Change "difference ERL" to "difference ERL dERL" where dERL is italic.
Make a similar change in other subclause throughout that specify dERL.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.2.2** *P* **364** *L* **4** # 309

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

Likely, Table 178-7 should be Table 178-8.

SuggestedRemedy

Change cross-reference from "Table 178-7" to "Table 178-8".

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.2.2** *P* **364** *L* **15** # 617

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The KR specification should use 92.5 ohm impedance for KR transmit ERL

SuggestedRemedy

add line in Table 178-8 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **178** *SC* **178.9.2.4** *P* **364** *L* **35** # 478

Healey, Adam — Broadcom, Inc.

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

"The reference value [...] is calculated based on the receiver package class to which the device adheres." SInce this subclause is about transmitter difference steady-state voltage, it seems that the calculation should be based on the transmitter package class.

SuggestedRemedy

Change "receiver" to "transmitter".

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.2.7** *P* **365** *L* **12** # 351

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(Electrical) SNDR*

The reference pacakge A and B SDNR are known specific value

SuggestedRemedy

I belive these are the value in https://www.ieee802.org/3/dj/public/24_11/healey_3dj_01_2411.pdf page 5 at least for package A, for service to community reference SNDR should be provided

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #481.

Cl **178** *SC* **178.9.3.2** *P* **366** *L* **23** # 310

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

178.9.3.3 should be compliant over the range as well.

SuggestedRemedy

Change "178.9.3.4 and 178.9.3.5" to "178.9.3.3 through 178.9.3.5"

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.3.3** *P* **366** *L* **29** # 537

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **R** *(Electrical) ITOL*

There isn't a minimum loss specified for the KR channel. Specifying this as the minimum channel loss from the KR interference tolerance test may not be appropriate. It is also not very clear what loss is being referred to.

SuggestedRemedy

Consider whether using the same minimum loss used for the interference tolerance test is appropriate. If so add to 178.10.2. "The recommended minimum channel insertion loss is 18dB. "
On page 727 line 9 replace "using a channel with the minimum insertion loss specified in 178.9.3.4" with "using an amplitude tolerance test channel" Add a sentence to the end of the paragraph. The loss of the amplitude tolerance test channel including the package loss of the compliant transmitter used in the test is equal to the Test 1 loss in table 178-10 .
If not then replace "using a channel with the minimum insertion loss specified in 178.9.3.4" with "using a minimal loss channel"

Response *Response Status* **C**

REJECT.
Resolve using the response to comment #535.

[Editor's note: Changed Line from 9 to 29]

Cl **178** *SC* **178.9.3.3** *P* **366** *L* **32** # 311

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

The more formal word "may" should be used instead of "is allowed to". Per style guide: "The word may is used to indicate a course of action permissible within the limits of the standard (may equals is permitted to)."

SuggestedRemedy

Change "is allowed to" to "may".
Implement also on page 727 line 13, page 755 line 16.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.3.4.1** *P* **366** *L* **48** # 711

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(Electrical) (bucket)*

0.8V

SuggestedRemedy

insert space

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.3.4.1** *P* **366** *L* **50** # 312

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket) ITOL*

So crosstalk is noise, so in this sentence what is "noise", also crosstalk and noise are not distortions per se, but rather perturbations. Is noise referring to alien noise or intrinsic noise? Distortion implies a changing of the launched signal such as insertion loss, bandwidth, and non-linearity, which I don't think are intended here.

SuggestedRemedy

Change "The channel noise source emulates crosstalk,
noise, and any other non-equalizable signal distortions that may be introduced by a transmitter or channel."
To "The channel noise source emulates crosstalk, alien and intrinsic noise, and any other non-equalizable signal perturbations that may be introduced by a transmitter or channel."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change from
"The channel noise source emulates crosstalk, noise, and any other non-equalizable signal distortions that may be introduced by a transmitter or channel."
to
"The channel noise source represents non-equalizable impairments that may be introduced by a transmitter or channel."

Cl **178** *SC* **178.9.3.4.2** *P* **367** *L* **17** # 313

Brown, Matt — Alphawave Semi

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket)*

It is not clear which text below this table are exceptions vs addition material. Usually, we use a dashed list to annotate the exceptions.

SuggestedRemedy

Identify the relevant exceptions within a dashed list.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license, with consideration of the response to comment #314.

Cl **178** *SC* **178.9.3.4.2** *P* **367** *L* **21** # 314

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(Electrical) (bucket)*

This is not an ordered list so should be formatted as dashed list.

SuggestedRemedy

Reformat as dashed list.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.3.4.2** *P* **367** *L* **35** # 315

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(Electrical) (bucket)*

This is not an ordered list so should be formatted as dashed list. Further, it is not permitted to use the same list values (e.g., a), b), c)), for two separate lists within the same subclause.

SuggestedRemedy

Reformat as dashed list.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.3.4.3** *P* **368** *L* **21** # 316

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

Per style guide this should be lettered list, not numbered list.

SuggestedRemedy

Reformat as lettered list.

Response *Response Status* **C**

ACCEPT.

Cl **178** *SC* **178.9.3.4.3** *P* **368** *L* **44** # 317

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(Electrical) (bucket)*

The noise is RMS so not defined by amplitude. Also, "higher noise" here is compound adjective so should be hyphenated.

SuggestedRemedy

Change "higher amplitude" to "higher voltage" or "higher noise" or similar.
If the current wording is desired, then add a hyphen "higher-amplitude".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change the text from "higher amplitude values" to "higher noise values."

Cl **178** *SC* **178.9.3.5** *P* **369** *L* **7** # 318

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *(Electrical) (bucket)*

This phrase is hard to parse: "and both JRMS and J4u03 are measured with the jitter frequency and amplitude set according to Case F from Table 179–12." I think it means that J_RMS and J4u_03 are measured after the sinusoidal jitter with frequency and amplitude for Table 179-12 is applied. Also, I think this can be broken into a pair of subbullets for clarity.

SuggestedRemedy

Change to:
-- For the COM parameter calibration described in 93C.2 item 7):
-- J4u is substituted by J4u03
-- JRMS and J4u03 are measured with applied sinusoidal jitter with frequency and amplitude set according to Case F from Table 179–12

Response *Response Status* **W**

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

Cl **178** *SC* **178.10** *P* **370** *L* **34** # 618

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The KR specification should use 92.5 ohm impedance for KR channel impedance

SuggestedRemedy

add line in Table 178-11 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **178** SC **178.10.1** P **371** L **1** # 479

Healey, Adam — Broadcom, Inc.

Comment Type **E** *Comment Status* **A** *ectrical) (bucket) COM MLSD*

"The maximum likelihood sequence detection (MLSD) defined in 178A.1.10 is to be used for the calculation of COM." Now that Table 178-12 includes a parameter that indicate whether or not maximum likelihood sequence detection is included, this statement has become redundant.

SuggestedRemedy

Remove this sentence. Also remove similar sentences in 179.11.7, 176C.7.1, and 176D.7.2.

Response *Response Status* **C**

ACCEPT.

Cl **178** SC **178.10.1** P **372** L **1** # 255

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, quantization noise parameters should be added to Table 178-13.

SuggestedRemedy

Add two quantization noise parameters with suggested values to the table. Please refer to slide 15 of the accompanying document for the proposed change.
Also, see shakiba_3dj_elec_01_250626.pdf.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178** SC **178.10.1** P **372** L **7** # 236

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **R** *ctrical) Reference impedance*

Adjust COM voltage to 46.25 ohms measurement reference.

SuggestedRemedy

Change
A_vtō 0.415
A_fetō 0.415
A_netō 0.608

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #237.

[Editor's note: Changed subclause from 178.19 to 178.10.1]

Cl **178** SC **178.10.1** P **372** L **33** # 379

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **ER** *Comment Status* **A** *ical) (bucket) table formatting*

Symbols fp1 and fp2 seem connected

SuggestedRemedy

May need to adjsut or incease spacing

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Adjust spacing with editorial license.

Cl **178** SC **178.10.1** P **372** L **43** # 254

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, an updated value for One-sided noise spectral density in Table 178-13 is needed.

SuggestedRemedy

Change One-sided noise spectral density parameter value in the table (line 43). Please refer to slide 15 of the accompanying document for the proposed change.
Also, see shakiba_3dj_elec_01_250626.pdf.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178** SC **178.10.3** P **373** L **33** # 596

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The ERL for a channel atTP0 and TP5 is defined without a reference impedance. The implied reference impedance is inferred from 178.9.1, 100-ohm. The use of a 100-ohm reference impedance for ERL is not consistent throughout D2P0.

SuggestedRemedy

Add definition of a 92.5-ohm reference impedance for the ERL computation, consistent with Annex179B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **178** *SC* **178.10.3** *P* **373** *L* **51** # 716

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucket) ERL*

Tukey window: it's not a flag (status bit) it's a switch (control bit)

SuggestedRemedy

Change Tukey window flag to Tukey window

Response *Response Status* **W**

REJECT.
The parameter tw in 93A.5 (as amended by 802.3ck-2022) is called "Tukey window flag".

Cl **178A** *SC* **178A** *P* **777** *L* **26** # 243

Shakiba, Hossein Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Add quantization noise.

SuggestedRemedy

Add a new section "178A.1.7.6 Quantization noise". Please refer to slides 3-5 of the accompanying document for the proposed sub-section content and text.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The CRG reviewed slides 19-22 of
<https://www.ieee802.org/3/dj/public/25_07/ran_3dj_01a_2507.pdf>.

Implement the suggested changes on slide 22 of ran_3dj_01a_2507 with editorial license.

Cl **178A** *SC* **178A** *P* **785** *L* **19** # 235

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

Re-normalization of s-parameter is not defined in the document

SuggestedRemedy

Add new section 178A.2
The conversion of S s-parameter with reference Z_0 to S' s-parameter with reference Z_1 is computed as follows:
S'= A^(−1) *(I−S*rho)^(−1)* (S−rho)*A
where:
rho= (Z_1−Z_0)/(Z_1+Z_0)
A= (Z_1+Z_0)/sqrt(Z_1*Z_0)
S is the original s-parameter matrix with Z_0 as the original diagonal impedance matrix where each diagonal entry is the impedance of that port.
S' is the new s-parameter matrix with Z_1 as the new diagonal impedance matrix where each diagonal entry is the impedance of that port

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The CRG reviewed slide 13 of
<https://www.ieee802.org/3/dj/public/25_07/ran_3dj_01a_2507.pdf>.

Add equations and supporting text to 178A.1.4, as shown in slide 13 of ran_3dj_01a_2507, with editorial license. Add a reference for the equations if possible.

Cl **178A** *SC* **178A.1.3** *P* **768** *L* **20** # 610

Palkert, Thomas Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

All impedance values should be 92.5 ohms

SuggestedRemedy

Channel can be measured with 100 ohms but should be converted to 92.5 ohms

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #235.

Cl **178A** *SC* **178A.1.7** *P* **774** *L* **32** # 247

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, "sampler" should be replaced with "quantizer".

SuggestedRemedy

Change "sampler" to "quantizer". Please refer to slide 9 of the accompanying document for the proposed change.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.7** *P* **774** *L* **50** # 244

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, Figure 178A-7 should show addition of the quantization noise after the sampler.

SuggestedRemedy

Add quantization noise to the figure. Please refer to slide 6 of the accompanying document for the proposed change.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.7** *P* **775** *L* **2** # 245

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, Table 178A-9 should include quantization noise parameters.

SuggestedRemedy

Add two quantization noise parameters to the table. Please refer to slide 7 of the accompanying document for the proposed change.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.7** *P* **775** *L* **15** # 248

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, "sampler" should be replaced with "quantizer".

SuggestedRemedy

Change "sampler" to "quantizer". Please refer to slide 9 of the accompanying document for the proposed change.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.7** *P* **775** *L* **19** # 246

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, Equation (178A-14) should include quantization noise PSD.

SuggestedRemedy

Add quantization noise PSD to the equation and its description to the descriptions. Please refer to slide 8 of the accompanying document for the proposed change.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.8.1** *P* **777** *L* **43** # 249

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, "sampler" should be replaced with "quantizer".

SuggestedRemedy

Change "sampler" to "quantizer". Please refer to slide 9 of the accompanying document for the proposed change.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.8.1** *P* **778** *L* **18** # 250

Shakiba, Hossein Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, quantization noise should be added before sampler output is applied to the feed-forward filter in Figure 178A-9.

SuggestedRemedy

Add quantization noise to the figure. Please refer to slide 10 of the accompanying document for the proposed change.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.9.3** *P* **782** *L* **17** # 251

Shakiba, Hossein Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, more text should be added to describe the procedure for deriving the probability density function of the quantization noise.

SuggestedRemedy

Add the suggested text in slides 11-12 of the accompanying document starting from line 17.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.9.3** *P* **782** *L* **21** # 252

Shakiba, Hossein Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, Equation (178A-36) should include quantization noise PSD.

SuggestedRemedy

Add quantization noise PSD to the equation. Please refer to slide 13 of the accompanying document for the proposed change.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.10** *P* **783** *L* **19** # 253

Shakiba, Hossein Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, quantization noise should be added before sampler output is applied to the feed-forward filter in Figure 178A-10.

SuggestedRemedy

Add quantization noise to the figure. Please refer to slide 14 of the accompanying document for the proposed change.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **178A** *SC* **178A.1.10.1** *P* **784** *L* **36** # 262

Shakiba, Hossein Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *(Electrical)*

Proper handling of negative MLSE delta_COM in the COM code was presented in COM ad hoc and approved (shakiba_3dj_COM_02_250408.pdf).
Pointed out by Adee during the discussions, I took the action to look at the implication of this on the draft. This comment is to add a statement to this section to instruct the reader how a possible negative delta_COM should be handled.

SuggestedRemedy

Add a new paragraph at the end of this section with the following content:
"Due to the addition of this additional receiver noise when calculating the advantage of the MLSD-based receiver, there may be occasional cases where the DFE-based receiver performs better. In these cases, the MLSD function should be disabled. This can be done by ignoring the last term in Equation (178A-38) and setting it to zero and setting COM to COM_DFE. This process should also be applied if for any other reason, such as approximations in math and calculations, similar cases are encountered."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
With editorial license, insert the following sentence before the last paragraph in 178A.1.10.
"If the value of COM calculated by Equation (178A-39) is less than COM_DFE, then the value of COM is set to be equal to COM_DFE."

Cl **178B** *SC* **178B** *P* **786** *L* **6** # 484

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

Comment Type **TR** *Comment Status* **A** *(Common) ILT scope*

ISL is a major new capability, and needs to be clearer than currentlyspecified.
For example, the title indicates "Inter-sublayer link training for electrical and optical interfaces". However, it is the understanding of the commentor that this clause covers link training for the interfaces as well as the total path.
Additionally, as this is a new capability, it is not clear that there won't be differences for link training between AUIs and PMDs.

SuggestedRemedy

Separate Annex 178B into 3 Annexes - one for the total path, one for the AUIs, and one for PMDs. Clauses with tables pointing to Annex 178B would need to be updated to point to the correct clause

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B** *P* **786** *L* **12** # 424

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *(Common) ILT scope*

There should be a distinction between "ILT", which is a protocol on a single ISL, and the end-to-end (RS-to-RS) path bring-up procedure. The latter is an ability that is enabled by the former, but is system-level result, while ILT is a local mechanism.

Additional terminology may be helpful, e.g. "Physical layer startup procedure".

SuggestedRemedy

Add a definition of "Physical layer startup procedure" and update the text in multiple places to distinguish it from "ILT" used over a single ISL. Implement with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.2** *P* **786** *L* **18** # 220

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Common) ILT scope*

The overview of ILT is confusing. ILT has two aspects - there is per-ISL training, and there is the end-to-end path startup behavior. These need to be more clearly separated in the overview text. The "continuous exchange of fixed-length training frames" is not entirely accurate - that may be what happens during the training phase, but is certainly not what happens once the training is completed.

SuggestedRemedy

Rewrite the paragraph as follows:
ILT describes a set of processes that serve two purposes: facilitating timing recovery and optimizing performance on individual ISLs, and coordination of ISLs along a path to enable a smooth path start-up. The individual link training is performed via the exchange of fixed-length training frames between peer interfaces of an ISL that enable the transmitter to optimize the performance of the ISL. Path start-up is performed via the exchange of status indications across the set of ISLs that exist between the path endpoints.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the changes to 178B.2 and 178B.5 as proposed on slides 32 and 33 of the following contribution:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03a_2507.pdf

Implement with editorial license.

Cl **178B** *SC* **178B.2** *P* **786** *L* **18** # 374

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(Common) ILT scope*

3 major functions are included in the ILT: Electrical LT, Optical LT, and inter-sublayer link signal or RTS. Designating everting as ILT is rather confusing throughout the draft.

SuggestedRemedy

I suggest the following definition:
All electrical link training called "ELT"
All optical link training called "OLT"
Inter-sublayer signaling RTS called "ILT" or could be called "ILM" (inter-sublayer link messaging)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.2** *P* **786** *L* **19** # 498

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

The english isn't good.

SuggestedRemedy

Change "in a ISL or multi-ISL paths" to "in a ISL path or multi-ISL paths"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.3** *P* **786** *L* **25** # 124

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

You define terms in this subclause but named the subclause "Conventions". Why not be consistent with 802.3-2022 and rename it "Definitions"?

SuggestedRemedy

Rename subclause "Definitions".

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.3** *P* **786** *L* **31** # 221

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

The definition of AUI component in Annex 178B uses the terms 'AUI upper component' and 'AUI bottom component', whlie related text in 45.2.1.269 uses 'upper AUI component' and 'lower AUI component'. The terms should be consistent between the two.

SuggestedRemedy

Upper and lower works better than upper and bottom. Change the definition in 178B.3 to use 'upper AUI component' and 'lower AUI component'.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.3** *P* **786** *L* **33** # 52

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

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

Given the introduction of inter-sublayer link training to the Ethernet world, it would be helpful if the term inter-sublayer link (ISL) was displayed graphically for the reader.

SuggestedRemedy

Implement figure on Page 3 of https://www.ieee802.org/3/dj/public/adhoc/electrical/25_0605/dambrosia_3dj_elec_02_250605.pdf with editorial license

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The suggested remedy appears to point to the wrong contribution. The correct URL is: https://www.ieee802.org/3/dj/public/adhoc/electrical/25_0605/dambrosia_3dj_elec_01_250605.pdf

An updated figure is provided on slide 22 of the following editorial contribution: https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03_2507.pdf

This figure illustrates the architecture concepts as defined in Draft 2.0. Other comments may change some of these features.

Add a figure where appropriate based on the figure in slide 22 of brown_3dj_03_2507.

Update the figure as required to suit the adopted responses of other comments.

Implement with editorial license.

Cl **178B** *SC* **178B.3** *P* **786** *L* **34** # 222

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

The definition of ISL is somewhat awkward. The two PMDs are not really 'adjacent sublayers' in the same sense that a pair of PMAs within a PHY implementation are. Also, the definition should be consistent as to whether the sublayers are or are not part of the ISL. As written, it suggests that the ISL is either the AUI (not including the PMAs) or a pair of PMDs plus the medium.

SuggestedRemedy

Change the text to read:
The xAUI-n between a pair of adjacent PMA sublayers, or the MDI between a pair of PMD sublayers.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the defintion of ISL to:
"An ISL is either an xAUI-n (a pair of AUI components and the AUI channel between) or a pair of PMDs (in different PHYs) and the medium between."

Implement with editorial license.

Cl **178B** *SC* **178B.3** *P* **786** *L* **36** # 112

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

The ISL should be defined as the link between two adjacent sublayers and excludes the sublayers themselves. ISLs can be between two adjacent sublayers in the same Physical layer implementation (e.g., connecting PMAs in a single PHY) or between adjacent sublayers in two autonomous systems (e.g., connecting the two PHY PMDs via a medium).

SuggestedRemedy

Replace "The ISL may be an xAUI-n between a pair of PMA sublayers within the same Physical Layer implementation or a pair of PMDs and the medium between"

with

"The ISL may be an xAUI-n between a pair of PMA sublayers within the same PHY. The ISL may be an MDI between a pair of PMD sublayers, each of which is instantiated in separate PHYs".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #222.

Cl **178B** *SC* **178B.3** *P* **786** *L* **38** # 115

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

Add single and multi-ISL definiton here to help with 178B.5.

SuggestedRemedy

Add: "A single-ISL path comprises exactly two sublayers connected by a single ISL. A multi-ISL path comprises three or more sublayers connected in series by ISLs".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.3** *P* **786** *L* **41** # 113

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *ɪmon) ILT definitions (bucket)*

The second sentence might be too short and risks causing confusion.

SuggestedRemedy

Replace "For a PMD this term is equivalent to link partner"

with

"In the case where the ISL is an MDI between two PMDs, this term is equivalent to link partner".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "For a PMD this term is equivalent to link partner."
To: "In the case where the ISL is between two PMDs, this term is equivalent to link partner"
Implement with editorial license.

Cl **178B** *SC* **178B.4** *P* **786** *L* **52** # 458

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket) ILT*

The second paragraph of 178B.4 talks about "devices" that have one or two physically instatied interfaces. The use of "former" and "latter" is refering to one and two? Or PMD and AUI?.

What about devices with no physically instantiated interfaces, it still uses ILT on the medium.

SuggestedRemedy

Change the 2nd paragraph from:
Devices in a path may include one or two physically instantiated interfaces, specifically PMD or AUI components. An example of the former is a PMA adjacent to a PCS or to a PHY XS with a single AUI-C2M (Annex 176D) or AUI C2C (Annex 176C) interface (the interface with the PCS or PHY XS is never physically instantiated). An example of the latter is a retimer with an AUI C2C (Annex 176C) interface on one side and an AUI-C2M (Annex 176D) on the other side.

To:
Devices in a path may include zero, one or two physically instantiated interfaces between the MAC and the PMD. Figure 176B-1 depicts a device with zero physically instantiated interfaces. The left two stacks in Figure 176B-2 depict a device with a single xAUI interface, either a AUI-C2M (Annex 176D) or AUI-C2C (Annex 176C). The right 3 stacks in Figure 176B-2 depicts a device with two xAUI interfaces.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
ILT is only applicable to physically instantiated interfaces.
The use of "later" and "former" is confusing.
Resolve using the response to comment #114.

Cl **178B** *SC* **178B.4** *P* **786** *L* **52** # 223

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *ıon) ILT components (bucket)*

The second paragraph is confusing. The text begins with "Devices in a path may include one or two physically instantiated interfaces, specifically AUI or PMD components." However, an end-to-end path between two PCS could include as many as 5 ISLs: two AUIs in each Physical Layer implementation, plus the MDI between the PMDs.

SuggestedRemedy

If this paragraph was not present, the information in the rest of the clause is still clear. Delete the paragraph.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The first sentence is important, but it and the rest of the paragraph should be reworded to make it more understandable.

Replace the paragraph with the following:
"Devices in a path have one or two physically instantiated interfaces. A physically instantiated interface is either a PMD or an AUI component. An example of a device with one physically instantiated interface is a PMA adjacent to a PCS with a single AUI-C2M (Annex 176D) or AUI-C2C (Annex 176C) interface (the interface with the PCS or PHY XS is never physically instantiated). An example of a device with two physically instantiated interfaces is a retimer with an AUI-C2C (Annex 176C) interface on one side and an AUI-C2M (Annex 176D) on the other side."

Implement with editorial license.

Cl **178B** *SC* **178B.4** *P* **786** *L* **52** # 114

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

It is unclear if "former" and "latter" refer to "one or two instantiated interfaces" or to "PMD or AUI components" in the next statements. Suggest removing text to improve clarity.

SuggestedRemedy

Delete "[…] specifically PMD or AUI components" from sentence.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.4** *P* **787** *L* **5** # 224

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Common) (bucket) ILT*

While it's true that there are "one or more per-lane functions", this language is misleading. For an n lane interface there are exactly n per-lane functions.

SuggestedRemedy

Change "one or more per-lane functions" to "one per-lane function for each physical lane"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "and one or more per-lane functions"
To: "and one per-lane function for each lane associated with the interface"

Cl **178B** *SC* **178B.4** *P* **787** *L* **30** # 375

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(Common) ILT function*

Figure 178B-1 is trying to convey two different messages and combining the two function as shown is confusing

SuggestedRemedy

Some suggested improvements
Call them figure 1A and 1B
Figrue 1A is for AUI so it needs two ILT functions in the box (left and right)
Figure 1B better to show as following:
-Receive function connected to Transmit Function left-right (output SLi)
-Receive function to Transmit Function right-left (input DLi)
-Duplicate per-lane ILT function one for Egress and one for Ingress

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

ILT is one function. Only in the case of a retimer we have two functions. An AUI may include a single ILT function if it is not part of a retimer.

The transmit and receive functions of ILT are closely related, separating them may cause more confusion than adding clarity.

However, some clarification in the figure is warranted.

In Figure 178B-1, add a box indicating the boundaries of an AUI component or PMD.

Label the vertical dashed line as the service interface.

Cl **178B** *SC* **178B.5** *P* **787** *L* **37** # 290

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *(Common) ILT scope*

The term inter-sublayer link training (or ILT) by name defines a protocol over an inter-sublayer link (or ISL). Each ISL is one of several possible physical links between a pair of MAC sublayers. It is possible only a subset of the ISLs supports ILT. Annex 178B also defines a path start-up protocol which uses the outcome of ILT on each of the physical links, where supported, to determine when the path between a pair of PCSs or between a pair of extender suppliers is ready, allowing for some ISLs that do not support ILT. However, the combination of these two layers of functionality are references only as ILT. This is confusing!

SuggestedRemedy

Within Annex 178B, clearly differentiate these two processes (inter-sublayer link training and path-start-up protocol) as being separate from each other, rather than ILT being a combination of these two. ILT would refer to the process with operates on a specific ISL and with PSP the process that links the states of all ISL on a path. Throughout the draft specify and references these two functions separately.
A contribution will be provide to explore this further.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.5** *P* **787** *L* **39** # 116

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

Improve clarity.

SuggestedRemedy

Replace: "ILT enables independent ISL training in a multi-ISL path that includes AUI components and PMDs. It also supports operation over paths that include ISLs that do not implement ILT".

With

"ILT supports independent training of ISLs in a multi-ISL path. ILT also operates over paths that include ISLs that do not support ILT".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The referenced text should be improved. Comment #220 proposes to improvement the description and termilogy for the ILT functionality.

Resolve this comment based on the resolution to comment #220.

Cl **178B** *SC* **178B.5** *P* **787** *L* **43** # 226

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Common) ILT description*

The bullet list that attempts to explain how path start-up works is not succeeding. It is not clear if "ready to send" is related to the local_rts and remote_rts indications or if it is something different. It seems like it must be something different, since the third bullet says you can only send local_rts or remote_rts across an ISL that is ready to send. The last two bullets seem to introduce a notion of "device" that is undefined. The concept of an ISL includes a physical instantiation of an AUI or a medium, so the intended meaning of 'device' is reasonably clear (i.e., the endpoint of an ISL), but it would be better to avoid using 'devices' in the description and focus on ISLs and their endpoints.

SuggestedRemedy

The intended behavior is not really clear, so it's hard to provide a specific remedy. It think the intention is that local_rts originates at the A end PCS and traverses all sublayers and ISLs until it reaches the Z end PCS. Upon receiving local_rts, the Z end PCS signals remote_rts to the A end PCS. (and of course vice versa for Z-->A). So local_rts makes its way down the stack in one system, across the medium, and up the stack in the peer system. In order for local_rts (or remote_rts) to go across an ISL, that ISL must be in a 'ready to send' condition that has nothing to do with the 'local_rts' or 'remote_rts' variables, but instead depends on ILT (for ISLs that support ILT) or some other mechanism (for those that don't support ILT) to determine if the ISL is 'ready to send'. If that is correct, write text accordingly to explain this, and modify the terminology or provide better definitions so that it's clear that "ISL ready to send" is not the same thing as local_rts or remote_rts. If the intended behavior is something else, rewrite the text to be more clear about what is intended.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: "local_rts indicates that an AUI component or PMD is ready to send and receive normal data and propagates from the PCS at one end of the path towards the PCS at the other end of the path."
To: "local_rts indicates that an AUI component or PMD is ready to send and receive normal data (it reached the ISL_READY state in Figure 178B-8) and propagates from the PCS at one end of the path towards the PCS at the other end of the path."

Change: "When a device both sends local_rts and receives remote_rts in both directions"
To: "When an AUI component or PMD both sends local_rts and receives remote_rts in both directions"

Change: "When all devices are in data mode, communication on the path is established."
To: "When all AUI components and PMDs in the path are in DATA mode, communication on the path is established."

Replace "device" throughout the Annex with "AUI component or PMD", where appropriate.

Implement with editorial license.

Cl **178B** *SC* **178B.5** *P* **788** *L* **3** # 465

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket) ILT*

The otherwise is not necessary as the heading says you use one or the other.

SuggestedRemedy

Remove the "otherwise".

Response *Response Status* **W**

ACCEPT.

Cl **178B** *SC* **178B.5.1** *P* **788** *L* **13** # 117

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Improve clarity.

SuggestedRemedy

Replace "Local variables are sent to the peer interface via the training frames. Remote variables are received from the peer interface"

with

"Peer interfaces send local variables and receive remote variables via the training frames".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "Local variables are sent to the peer interface via the training frames. Remote variables are received from the peer interface."
To: "Local variables are sent to the peer interface and remote variables are received from the peer interface via the training frames."
Implement with editorial license.

Cl **178B** *SC* **178B.5.1** *P* **788** *L* **15** # 228

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **R** *(Common) ILT description*

This clause appears to be about the process for training each lane of an ISL, so it's not clear why local_rts or remote_rts belong here (since they are about the end-to-end path - although the state diagrams clause suggests that each ISL maybe has its own local_rts and remote_rts - but that would mean that local_rts and remote_rts are not signals that propagate from PCS to PCS). While the intended meaning of 'device' is clear, it would be better to describe the protocol in terms of ISLs and the endpoints of ISLs.

SuggestedRemedy

Clarify what condition it is that causes the propagation_timer to be started… presumably it's not related to local_rts and remote_rts (or if it is, the definitions of local_rts and remote_rts need to be modified to make it clear that they apply to each lane of each ISL, not just to PCS-to-PCS communication).

Response *Response Status* **C**

REJECT.

Condition to start the propagation_timer is well defined in the referenced Figure 178B–8 "Training control state diagram".

Note that in 178B.14.1 it states "Should there be a discrepancy between a state diagram and descriptive text, the state diagram prevails."

Cl **178B** *SC* **178B.5.1** *P* **788** *L* **16** # 118

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT*

In this subclause, I assume we are describing the interface behavior of Inter-sublayer Links (ISLs) and not the behavior of the overall ILT path from PCS to PCS (or XS to XS). If this assumption is correct, use of the term "device" is confusing.

SuggestedRemedy

Replace the word "device" with "sublayer".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #226.

Cl **178B** *SC* **178B.5.1** *P* **788** *L* **21** # 587

Shrikhande, Kapil — Marvell

Comment Type **T** *Comment Status* **A** *(Common) (bucket) ILT*

"rx_ready" is not defined before this term is used. rx_ready is used on lines 21 and 23. Presumably rx_ready is receiver ready, which is defined later in clause in 178B.8.1 ?

SuggestedRemedy

Define rx_ready and / or clarify that this variable is same as receiver ready defined in 178B.8.1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "waiting for either rx_ready or remote_rts to change"
To: "waiting for either local_rts or remote_rts (see 178B.14.2.1) to change"

Cl **178B** *SC* **178B.5.1** *P* **788** *L* **30** # 291

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **R** *(Common) ILT enable*

There seems to be some confusion around whether ISL is required or optional.Clause 178 through 183 there is rather definitive text specification that indeed ISL is mandatory to implement, but with the ability to enable and disable. Text in 178B.5.1 allows for a case where training is not available with clarification "(disabled or not defined for the interface type)", the latter portion meaning that there is no normative text in the clause or annex. However, it may be helpful to circumvent any confusing and add some clear text at the begin of Annex 178B stating that the requirement for ILT for each interface is defined by the Clause or Annex the specifies the interface and perhaps even adding table list interfaces for which it is mandatory.

SuggestedRemedy

Add the following sentence or similar to the first paragraph in 178B.4: "The mandatory or optional implementation of the ILT function is specified in the clause or annex that defines the interface."

Response *Response Status* **C**

REJECT.

There is no consensus to implement the suggested remedy.

Cl **178B** *SC* **178B.5.3** *P* **789** *L* **24** # 376

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *(Common) ILT retimer*

Figure can improve for better representation

SuggestedRemedy

Suggest the folloiwng:
- CDR ouput add mux (Training/mission modes)
- Connect Training frame decode to training frame encode
- You can also create a new block called "Training State Machine" then connect training decode and encode to it.

Response *Response Status* **U**

REJECT.
Figure 178B-2 is a reference model meant specifically for illustrating the operation of a retimer, not a full functional diagram. Adding too much detail to this diagram will make it unreadable. This "state machine" would need to be connected to tx_mode and the USE_TX_CLOCK signals as well as the training frames.

The commenter is encouraged to provide a detailed proposal with illustration.

Cl **178B** *SC* **178B.5.3** *P* **789** *L* **44** # 421

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *(Common) ILT extender*

The text about training xMII extenders does not address the communication of the status variables isl_ready and remote_rts between interfaces (PMD to AUI and vice versa) when there is a PHY XS and PCS between them.
Ideally, this communication should be the same as the one defined in 178B.14.2.1 using adjacent_signal_ok, but the case of an extender is not covered by NOTE that describes what "adjacent" is.

Since this behavior is specific to PHYs attached to extenders, it should be specified in this subclause, preferably with a diagram.

SuggestedRemedy

Add a NOTE in 178B.5.3 stating that, for the purpose of adjacent_signal_ok, the adjacent interface of a PMD in a PHY attached to an xMII extender is the service interface of the PHY XS; and the adjacent interface of the AUI component above the PHY XS is the service interface of the PMD.
Add a figure to illustrate the communication of adjacent_signal_ok between the PMD and the AUI (across the PCS and PHY XS, and possibly other sublayers).

Response *Response Status* **C**

REJECT.

The CRG reviewed slides 24 to 28 in the following contribution:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03a_2507.pdf

Straw poll TF-1 (below) shows strong consensus to define startup signaling that extends RS to RS.

However, the proposed solution does not provide sufficient detail to implement at this time. For instance, it is missing details for exchanging signals across the PCS service interface.

A detailed contribution on this subject is encouraged.

Straw poll #TF-1 (directional)
I support the direction of extending path start-up signaling (as proposed in D2.0 comment #421) from Reconciliation sublayer to Reconciliation sublayer.
Yes: 23
No: 1
Abstain: 20

Cl **178B** *SC* **178B.6.2** *P* **791** *L* **7** # 450

He, Xiang — Huawei

Comment Type **TR** *Comment Status* **A** *(Common) ILT types*

The definition of E1 and O1 is unclear.
"Two formats are defined for the control and status fields, E1 and O1." So E1 and O1 are two "formats" for the control and status fields. (This is the origin of E1 and O1 in the document). After this point in 178B, they were used as "E1 interfaces" and "O1 interfaces" all over the places - like in 178B.7. There are also 5 references using "Type E1 interface" and "Type O1 interface" in PMD clauses, like in 183.5.12.
We should do a better definition for these terms in Clause 178B, and use clear references in other clauses.

SuggestedRemedy

First change: Clearly define two types of interfaces, "Type E1 interface" and "Type O1 interface", and stick to these terms all across 178B and the document.

Second change: Change the reference from “178B" to the subclause where they were defined, like "178B.6.2".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #634.

Cl **178B** *SC* **178B.6.2** *P* **791** *L* **7** # 229

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT types*

While it is probably not likely that any reader of this annex would get confused, "E1" is of course the name of the European PDH frame structure, so it might be better to avoid using that name. Further, the last sentence "Each interface using ILT shall identify which format is relevant for it" reads too much like a requirement that would show up in a PICS, but that is clearly not what is intended here (the intent being that electrical PHYs use the E format and optical PHYs use the O format).

SuggestedRemedy

The formats E1 and O1 are really about electrical or optical 200G/lane signaling. Maybe it would be better to refer to them that way (i.e., replace "E1" with "electrical 200G/lane" and "O1" with "optical 200G/lane". With that change, the last sentence could be deleted. If the change is made, it should be applied throughout the annex, and potentially in other clauses in the document that may refer to the frame names..

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #634.

Cl **178B** *SC* **178B.6.2** *P* **791** *L* **7** # 634

Law, David — HPE

Comment Type **T** *Comment Status* **A** *(Common) ILT types*

Subclause 178B.6.2 'Control and status fields' says that 'Two formats are defined for the control and status fields, E1 and O1.'. Everywhere else in the draft, however, it seems that E1 and O1 are defined as types of interfaces. For example, subclause 178B.7 'Control field structure' says, 'The structure of the control field for E1 interfaces shall be as shown in Table 178B–2 and for O1 interfaces as shown in Table 178B–3.'.

SuggestedRemedy

Suggest that the text 'Two formats are defined for the control and status fields, E1 and O1.' is changed to read 'The type E1 interface and a type O1 interface use different formats for the control and status fields (see 178B.7).'.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

There is no consensus to change to interface types. However, some clean up would be helpful.

Update text throughout the draft to consistently refer to "E1 format" and "O1 format", where appropriate.

Implement with editorial license.

Cl **178B** *SC* **178B.7** *P* **795** *L* **4** # 230

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **R** *(Common) (bucket) ILT*

It would be better to combine tables 178B-2 and 178B-3 into a single table, with one column for the electrical interfaces and one for the optical interfaces. That would make it easier for the reader to see that the formats are the same, except that on optical links some of the fields are not used. The same applies to tables 178B-4 and 178B-5 in clause 178B.8

SuggestedRemedy

Change the table title to 'Control field structure for 200G/lane interfaces'
Change the heading of the 3rd column to "Electrical interfaces". Add a fourth column titled "Optical interfaces, and populate it with the information that is in Table 178B-3.
Delete Table 178B-3
Make corresponding changes in clause 178B.8 for tables 178B-4 and 178B-5.

Response *Response Status* **C**

REJECT.
The tables as written clearly show what is required for either the optical or electrical interface. There is potential that the function of some reserved bits may be assigned different functions and might be combined in different ways so a combined table would get messy. Currently only two types, E1 and O1, are defined, but others might be defined making the table more crowded and perhaps more diversive.

Cl **178B** *SC* **178B.7.1** *P* **796** *L* **26** # 485

Kimber, Mark Semtech

Comment Type **TR** *Comment Status* **A** *(Common) (bucket) ILT*

Potentially confusing as this only applies to E1 cases but refers to configurations specified in the AUI and PMD clauses. There is a comment in the O1 table stating it should be ignored on receipt. It would be better to also state in this text that it refers only to E1.

SuggestedRemedy

Change
The initial condition request bits are used to select one of the up to six predefined transmitter equalizer configurations (presets) specified in the AUI annexes or PMD clauses.
To
Only applies for E1 intefaces. The initial condition request bits are used to select one of the up to six predefined transmitter equalizer configurations (presets) specified in the AUI annexes or PMD clauses.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.7.5** *P* **796** *L* **50** # 486

Kimber, Mark Semtech

Comment Type **TR** *Comment Status* **A** *(Common) (bucket) ILT*

Potentially confusing as this only applies to E1 cases. There is a comment in the O1 table stating it should be ignored on receipt. It would be better to also state in this text that it refers only to E1.

SuggestedRemedy

Change
The coefficient select bits are used to identify the coefficient that is the target of a coefficient request.
To
Only applies for E1 interfaces. The coefficient select bits are used to identify the coefficient that is the target of a coefficient request....

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.7.6** *P* **797** *L* **1** # 487

Kimber, Mark Semtech

Comment Type **TR** *Comment Status* **A** *(Common) (bucket) ILT*

SuggestedRemedy

Change
The coefficient request bits are used to change the value of the coefficient specified by the coefficient select
bits.
To
Only applies to E1 interfaces. The coefficient request bits are used to change the value of the coefficient specified by the coefficient select
bits.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.8** *P* **797** *L* **20** # 111

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) ILT frames*

The ILT bit is not used anyway in Annex 178B.

SuggestedRemedy

Change bit 14 in the status field in Tables 178B-4 and 178B-5 to "Reserved"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Based on straw poll there is support to make the proposed change.

Implement the suggested remedy.
Also, delete the ILT bit definition in 178B.8.2.

Implement with editorial license.

Straw poll #TF-2 (directional)
I support changing the ILT bit (bit 14 in E1 and O1 status frame) to reserved.
Yes: 12
No: 7
Abstain: 17

Cl **178B** *SC* **178B.8.5** *P* **799** *L* **1** # 120

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Consistently use "1" for boolean true and "0" for boolean false.

SuggestedRemedy

Replace "[…] and is not set to one" with "and is not set to 1".

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.10** *P* **799** *L* **44** # 467

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket) ILT*

The fact that polarity_invert persists after training completes should be the last part of this sub-clause.

SuggestedRemedy

Move the 2nd paragraph in 178B.10 to be after the NOTE.

Response *Response Status* **W**

ACCEPT.

Cl **178B** *SC* **178B.10** *P* **799** *L* **50** # 121

Mascitto, Marco Nokia

Comment Type **T** *Comment Status* **A** *(Common) ILT enable*

If this note is making reference to an ISL that can be administratively disabled by system management, this should not be allowed. See my comment regarding page 804, line 18.

SuggestedRemedy

Do not allow management control of ILT for ISLs required to support it.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #126.

Cl **178B** *SC* **178B.11.2** *P* **800** *L* **47** # 461

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) (bucket) ILT*

No pointer to the CHECK_REQ function is provided.

SuggestedRemedy

Add the following sentence to the last paragraph of 178B.11.2: "The function CHECK_REQ is defined in 178B.14.3.1."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Add the following sentence to the last paragraph of 178B.11.2: "The function CHECK_REQ is defined in 178B.14.3.2.".
Implement with editorial license.
[Editor's note: changed page from 783 to 800]

Cl **178B** *SC* **178B.13** *P* **802** *L* **47** # 122

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Consistently use "1" for boolean true and "0" for boolean false.

SuggestedRemedy

Replace "[…] transmitted training frames is set to one" with "transmitted training frames is set to 1".

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.14.2.1** *P* **803** *L* **46** # 123

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT adjecency*

This is not very clear. I would suggest adding the definition of "adjacent service interface" in subclause 178B.3.

SuggestedRemedy

I would suggest adding the definition of "adjacent service interface" to subclause 178B.3 and referencing a diagram, like the one on Slide 3 of "Making Sense out of ILT" (J. D'Ambrosia, M. Brown, 802.3dj Joint Ad hoc Mtg - 05 Jun 2025).

Adjacent service interface
The service interface adjoining a PMD or AUI component to a PMA.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Slide 20 of the following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03a_2507.pdf

Although a figure similar to the one provided on slide 20 would be helpful, a contribution with full details is required.

Implement the suggested wording changes on slide 20 of brown_3dj_03a_2507.

Implement with editorial license.

Cl **178B** *SC* **178B.14.2.1** *P* **803** *L* **47** # 448

Ran, Adee Cisco Systems

Comment Type **T** *Comment Status* **A** *(Common) ILT adjecency*

The second case in the NOTE says: "For ILT in an AUI component above a PMA, the adjacent service interface is the interface below the AUI component". That is the PMA's service interface. It may be easier to understand if it is stated.
Also, a figure illustrating the two cases would be helpful.

SuggestedRemedy

Change "the adjacent service interface is the interface below the AUI component" to "the adjacent service interface is the PMA service interface (below the AUI component)".
Add a figure, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #123.

Cl **178B** *SC* **178B.14.2.1** *P* **804** *L* **15** # 125

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **R** *(Common) (bucket) ILT*

Could be clearer.

SuggestedRemedy

Replace NOTE with the following text, "There is no specified time limit for ILT to complete. ILT should be restarted if there is an indication of an unrecoverable fault or a livelock situation. The definition of unrecoverable fault is beyond the scope of this annex".

Response *Response Status* **C**

REJECT.
Although the comment set the comment type to "E", the suggested remedy is a technical change.
Although the intent of the comment was an editorial change to the text within the note for clarification, the suggested remedy changes the meaning and intent of the note.

Cl **178B** *SC* **178B.14.2.1** *P* **804** *L* **18** # 231

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Common) ILT enable*

It is not clear why the ability to enable/disable ILT (via the mr_training_enable variable) is provided. In what circumstance would it be necessary or desirable for ILT to be turned off for any interface that can support it? Providing this ability complicates the feature (there are multiple places where the value of a variable depends on whether mr_training_enable is true or false) and creates the possibility of misconfiguration between two systems, or between a host and a module, complicating the process of bringing up end-to-end paths.

SuggestedRemedy

Reconsider the ability to disable ILT via management configuration.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #126.

Cl **178B** *SC* **178B.14.2.1** *P* **804** *L* **18** # 126

Mascitto, Marco — Nokia

Comment Type **T** *Comment Status* **A** *(Common) ILT enable*

It is my understanding that ILT is mandatory for all ISLs that make use of one or more 200 Gb/s lanes. These links will come up (i.e., tx_mode = data) IFF ILT completes successfully. I cannot envision a use case where ILT would be administratively disabled by system management (but do see the need to mr_restart, of course). Having the ability to disable ILT on these ISLs opens the door to operator misconfiguration, confusion during deployments, and reduces the plug-n-play value of 802.3 interfaces. It gets even more complicated if we consider the case of the multi-ISL path.

SuggestedRemedy

Do not allow management control of ILT for ISLs required to support it.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add text stating the following:
ILT is enabled by default
ILT must be disabled at both ends or enabled at both ends.
Manual configuration needed.
Recommendation to not disable on optical links
Note that performance could be compromised and end to end start-up would not work.

Implement with editorial license.

Cl **178B** *SC* **178B.14.2.1** *P* **804** *L* **27** # 127

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Clarify "device".

SuggestedRemedy

Replace "Boolean variable that controls the resetting of the device" with "Boolean variable that controls the global resetting of the ILT per-interface state machines".

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.14.2.1** *P* **804** *L* **32** # 459

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *(Common) ILT state diagrams*

Training status can not be both a AUI component variable and a per-lane training variable. Local_rts is an equivalent status to it and is mapped to a MDIO register bit.

SuggestedRemedy

Move the definition of training_status to 178B14.3.1
Remove the enumeration of "READY" from its definition.
Delete training_status <= READY from Figyre 178B-7

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following related contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_07/bruckman_3dj_01_2507.pdf

Implement the proposed changes on slides 5 and 6 of bruckman_3dj_01_2507.

Implement with editorial license.

Cl **178B** *SC* **178B.14.2.4** *P* **805** *L* **1** # 633

Law, David — HPE

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Change the title of subclause 178B.14.2.4 'State diagram figures' to read 'State diagram figure' since there is only one state diagram figure in this subclause, Figure 178B–7 'RTS update state diagram'.

SuggestedRemedy

See comment.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.14.3** *P* **805** *L* **51** # 128

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Missing "state machines".

SuggestedRemedy

Replace "An AUI component or PMD implements one instance of each of the Training control and the Training frame lock, and their associated variables[…]" with "An AUI component or PMD implements one instance of each of the Training control and the Training frame lock state machines, and their associated variables[...].

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change: "one instance of each of the Training control and the Training frame lock, and their associated variables"
To: "one instance of each of the Training control and the Training frame lock state diagrams, and their associated variables"

Cl **178B** *SC* **178B.14.3** *P* **806** *L* **1** # 499

Dudek, Mike Marvell

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

The Path ready descriptions apply to both E1 and O1 interfaces. It would read better if these paragraphs were placed before the paragraph that describes the different behaviour.

SuggestedRemedy

Move the first paragraph to after the 3rd paragraph.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.14.3.1** *P* **807** *L* **36** # 632

Law, David HPE

Comment Type **T** *Comment Status* **A** *(Common) ILT state diagrams*

The variables remote_mc_mode and remote_tp_mode are defined in subclause 178B.14.3.1 'Variables' but are not used in any of the respective state diagrams, Figure 178B–8 'Training control state diagram', Figure 178B–9 'Training frame lock state diagram', or Figure 178B–10 'Coefficient update state diagram'.

SuggestedRemedy

Remove the definitions of remote_mc_mode and remote_tp_mode from subclause 178B.14.3.1 'Variables'.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

These variables (remote_mc_mode and remote_tp_mode) are already listed in the management variables subclause.

Move the definitions for these variables to the relevant subclause.

Implement with editorial license.

Cl **178B** *SC* **178B.14.3.1** *P* **807** *L* **44** # 500

Dudek, Mike Marvell

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

"Correspondent" is strange. "Corresponding" is better, as used in the base document in multiple places e.g. 73.7.6 first paragraph

SuggestedRemedy

Change "correspondent" to "corresponding" here and on line 48.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.14.3.1** *P* **808** *L* **2** # 631

Law, David HPE

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Typo.

SuggestedRemedy

Change '... variable that is set to TRUE when ...' to read '... variable that is set to true when ..'.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.14.3.1** *P* **808** *L* **25** # 415

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **A** *(Common) ILT local_pattern*

In order to bring up a link that includes multiple ISLs, the functionality of ILT as specified by Figure 178B–7 and Figure 178B–8 is required across ISLs.

In PMDs that don't have a training protocol, and in PMDs that have it but training is disabled, the "quiet" and "local pattern" modes are the method of communicating the RTS to the peer.

However, the specification for the transmitted local pattern is incomplete - it only says "transmits a pattern from a valid pattern generator".

A local pattern for ILT should be specified in every PMD clause and AUI annex. This comment addresses the general requirements; additional comments are sumbitted for the PMD clauses (including 185 and 187 that currently do not have ILT as a requirement at all):

- For AUIs, the local pattern is PRBS31Q, which may be generated by the PMA to which the AUI component is attached and fed into the AUI component.
- For PMDs in clauses 178-182 (directly below an SM-PMA with no inner FEC), the local pattern is PRBS31Q, which may be generated by the SM-PMA and fed into the PMD service interface.
- For PMDs in clauses 183 and 185 (below a clause 177 or clause 184 Inner FEC, respectively), the local pattern is PRBS31 encoded by the Inner FEC, which may be generated by the Inner FEC and fed into the PMD service interface.
- For the PMD in clause 187, the local pattern is the output of the test pattern generator defined in 186.2.3.12.

SuggestedRemedy

Add text in the definition of tx_mode (178B.14.3.1) stating that the pattern used as local_pattern is specified in each clause or annex that uses the ILT function.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #416.

Cl **178B** *SC* **178B.14.3.4** *P* **809** *L* **4** # 460

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **R** *(Common) ILT timers*

The duration of the quiet_timer breaks the time alloted during AN to begin sending negotiated rate data stream per 73.4.3.

SuggestedRemedy

Presentation of options to be supplied.

Response *Response Status* **U**

REJECT.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_07/slavick_3dj_01_2507.pdf

There is some agreement that further clarification and perhaps updates to the specifications are needed. However, further details and consensus building is required.

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

Cl **178B** *SC* **178B.14.3.5** *P* **809** *L* **26** # 130

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT state diagrams*

These state diagrams inherit the variables, functions, and timers previously defined in 178B.14.2. There should be a statement to that effect.

SuggestedRemedy

Replace the first sentence with, "The training control state diagram (Figure 178B–8) defines the operation of ILT for AUI components and
PMDs, and makes use of the per-interface state diagram definitions (178B.14.2) and per-lane state diagram definitions (178B.14.3)".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Cl **178B** *SC* **178B.14.3.5** *P* **810** *L* **2** # 627

Law, David HPE

Comment Type **T** *Comment Status* **A** *(Common) ILT state diagrams*

The variables mr_restart and reset are used in Figure 178B–8 'Training control state diagram', Figure 178B–9 'Training frame lock state diagram', and Figure 178B–10 'Coefficient update state diagram', but are not defined in the associated subclause 178B.14.3.1 'Variables'.

SuggestedRemedy

Add the following two entries in alphabetical order to subclause 178B.14.3.1:

mr_restart
See 178B.14.2.1.

Reset
See 178B.14.2.1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #130.

Cl **178B** *SC* **178B.14.3.5** *P* **810** *L* **7** # 626

Law, David HPE

Comment Type **TR** *Comment Status* **A** *(Common) ILT state diagrams*

The variable training_status is used by the 'Training control state diagram' in subclause 178B.14.3.5 'State diagram figures' but is not defined in the associated subclause 178B.14.3.1 'Variables'.

In addition, it appears that the training_status is a per-interface variable based on the definition found in 178B.14.2.1 'Variables', yet it appears to be driven by both the per-interface 'RTS update state diagram' (Figure 178B–7) and the per-lane 'Training control state diagram' (Figure 178B–8). I'm not sure how this would operate.

As an example, if the Training control state diagram on one lane in an interface enters the FAIL state, it would set training_status for the interface to FAIL. If, however, the Training control state diagram on another lane in the same interface enters the PATH_UP state immediately afterwards, training_status for the interface would then be set to OK. This doesn't seem to be correct.

SuggestedRemedy

Provide a definition for the training_status variable used in Figure 178B–8 'Training control state diagram' in its associated subclause 178B.14.3.1 'Variables'. In addition, clarify the operation of training_status regarding it being driven by both the per-interface 'RTS update state diagram' (Figure 178B–7) and the per-lane 'Training control state diagram'.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #459.

Cl **178B** *SC* **178B.14.3.5** *P* **810** *L* **10** # 628

Law, David HPE

Comment Type **T** *Comment Status* **A** *(Common) ILT state diagrams*

The variables mr_training_enable, local_rts and remote_rts are used in Figure 178B–8 'Training control state diagram' but are not defined in the associated subclause 178B.14.3.1 'Variables'.

SuggestedRemedy

Add the following entry in alphabetical order to subclause 178B.14.3.1:

local_rts
See 178B.14.2.1.

mr_training_enable
See 178B.14.2.1.

remote_rts
See 178B.14.2.1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #130.

Cl **178B** *SC* **178B.14.3.5** *P* **810** *L* **45** # 629

Law, David HPE

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Subclause 178B.14.1 'State diagram conventions' says that 'The notation used in the state diagrams follows the conventions of 21.5.'. Table 21–1 'State diagram operators' defines the [not equal sign] character as 'Not equals'.

SuggestedRemedy

Change the text 'max_recovery_events !=0' to read 'max_recovery_events [not equal sign] 0'.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.14.3.5** *P* **810** *L* **46** # 630

Law, David HPE

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Subclause 178B.14.1 'State diagram conventions' says that 'The notation used in the state diagrams follows the conventions of 21.5.'. Table 21–1 'State diagram operators' defines the use of the [greater than or equal sign] character as 'Greater than or equal to'.

SuggestedRemedy

Change the text 'recovery_event_count >= max_recovery_events' to read 'recovery_event_count [greater than or equal sign] max_recovery_events'.

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.15** *P* **813** *L* **1** # 422

Ran, Adee Cisco Systems

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

"If the MDIO Interface is not implemented, an alternate mechanism to access management variables shall be provided"

Specifically for AUI-C2M, the most prevalent management interface is expected to be CMIS rather than MDIO. We expect CMIS to provide access to these management variables. CMIS should be referenced, at least informatively.

SuggestedRemedy

Append the following sentence: "For example, for modules using AUI-C2M, the Content Management Interoperability Services (CMIS) interface may be used as an alternate mechanism". Add a footnote with a reference to the CMIS specification (undated, since the current version does not address ILT yet).

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178B** *SC* **178B.15** *P* **813** *L* **50** # 635

Law, David HPE

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Suggest that the text 'Bit reference is provided for lane 0, bits for lanes 1 to 3 ...' is split into two sentences.

SuggestedRemedy

Change 'Bit reference is provided for lane 0, bits for lanes 1 to 3 ...' to read 'Bit reference is provided for lane 0. Bits for lanes 1 to 3 ...'

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.16.1** *P* **815** *L* **7** # 131

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Include complete title of annex. Forgot "optical".

SuggestedRemedy

Replace first sentence with, "The supplier of a protocol implementation that is claimed to conform to Annex 178B, Inter-sublayer link
training for electrical and optical interfaces, shall complete the following protocol implementation conformance statement (PICS) proforma".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement suggested remedy and also change the sublcause title to: "Protocol implementation conformance statement (PICS) proforma for Annex 178B, Inter-sublayer link training for electrical and optical interfaces"

Cl **178B** *SC* **178B.16.2.2** *P* **815** *L* **36** # 132

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Include complete title of annex. Forgot "optical".

SuggestedRemedy

Replace with "IEEE Std 802.3dj-202x, Annex 178B, Inter-sublayer link training for electrical and optical interfaces".

Response *Response Status* **C**

ACCEPT.

Cl **178B** *SC* **178B.16.3** *P* **816** *L* **18** # 133

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) (bucket) ILT*

Syntax error.

SuggestedRemedy

Replace "O<1>" with "O.1" per C21. Apply change to IL7 through IL10, and IL12 through IL16.

Response *Response Status* **C**

ACCEPT.

Cl **179** *SC* **179.2** *P* **387** *L* **46** # 639

Li, Mike Altera (An Intel compnany)

Comment Type **T** *Comment Status* **R** *:lectrical) (bucket) BERadded*

Refer to figure 174A-5,
1.) BERadded is the BER contribution outside of the measured sublayer link.
2.) Measured sublayer link is PCS-to-PCS including PMD and FEC. Both TX-FEC and RX-FEC must be included in the PHY-based measurement. To use FEC decoder, the incoming signal must be encoded (compared with the incoming signal does not need to be encoded to use PMA-based block error measurement).
3.) May the measured link have xMII extender outside this sublayer link (its BER budget is not 8e-6 according to CL-174A.4).
4.) with Table 174A-2, table 174A-3, xMII extender (if used) is not part of CER < 1.45e-11 spec.
5.) Considering all of these, the BERsdded value for CL-179.2 should not be simple 8e-6. Instead, it should be 8e-6 * Number_of_C2C_SubLayerLink outside of the measured sublayer link between the two ends MACs.

SuggestedRemedy

change the BERsdded value from 8e-6 to 8e-6 * Number_of_C2C_SubLayerLink outside of the measured sublayer link between the two ends MACs.

Response *Response Status* **C**

REJECT.
A PHY receiver needs to interoperate with a link partner that may or may not include an AUI-C2C. The expected block error ratio accounts for possible additional errors in an AUI-C2C in the link partner. This is a general expectation from the PHY that is independent of the link partner in a specific link.

Cl **179** *SC* **179.5** *P* **388** *L* **41** # 645

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket)*

The term "pervasive management" does not have a plain and ordinary meaning, nor is it defined anywhere in the document.

SuggestedRemedy

Either drop the word "pervasive" or provide a definition of "pervasive management".

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The phrasing used here is consistent with several previous clauses.
However, the word "pervasive" does not seem to be necessary, and the sentence can be simplified.
Change from
"the implementer may employ use of pervasive management or employ a dedicated electrical signal"
to
"the implementer may employ system management or use a dedicated electrical signal".

Cl **179** *SC* **179.8.1** *P* **390** *L* **37** # 650

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket)*

"The channel between TP0d to TP5d" is grammatically incorrect. It should be "between TP0d and TP5d", or it should be "from TP0d to TP5d".

SuggestedRemedy

Change to "between TP0d and TP5d"

Response *Response Status* **W**

ACCEPT.

Cl **179** *SC* **179.8.2** *P* **391** *L* **31** # 191

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 179.8.2 referred to the PATH_UP state.

SuggestedRemedy

Change "When operating in DATA mode, …" to "When operating in the PATH_UP state (see Figure 178B-8),…"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The two modes of the PMD transmit function are explicitly defined in the first paragraph of 179.8.2: "The PMD transmit function has two operating modes: DATA and TRAINING. The operating mode is controlled by the ILT function (see 179.8.9)". These modes are referenced in multiple places in the draft (although they are not currently defined by all PMDs).

The suggested remedy refers to a state of the training state diagram, but there is a variable, tx_mode, that explicitly controls the "DATA mode" behavior. This variable can be referenced to improve clarity.
Also, DATA and TRAINING modes of the transmit function should be defined for all PMDs that include an ILT function, and all references to these modes should be linked to the transmit function.

In the first paragraph of 179.8.2, change "The operating mode is controlled by the ILT function (see 179.8.9)" to "The operating mode is controlled by the tx_mode variable of the ILT function (see 179.8.9): it is DATA when tx_mode=data, and TRAINING otherwise".
Add similar paragraphs in 180.5.2, 181.5.2, 182.5.2, and 183.5.2 (possibly also 185.5.2 and 187.5.2 if ILT is added to these clauses).
Add an explicit reference to the transmit function in all instances of "DATA mode" and "TRAINING mode" across the draft, where appropriate.

Slide 15 and 16 in the following contribution provide extra background and implementation examples:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03_2507.pdf

Implement with editorial license.

Cl **179** *SC* **179.8.9** *P* **393** *L* **6** # 192

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 179.8.9 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **179** *SC* **179.8.9** *P* **393** *L* **13** # 464

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucket) presets*

Move Table 179-8 and here. It's relevent only to the ILT function.

SuggestedRemedy

Move Table 179-8 to the end of 179.8.9 and delete 179.9.4.1.3

Response *Response Status* **W**

REJECT.
The initial conditions (presets) table includes tolerances, and thus it is part of the electrical specifications. Its location is consistent with previous clauses.
The suggested change is not considered an improvement of the draft, and may be confusing to readers.
[Editor's note: Changed page from 379 to 393]

Cl **179** *SC* **179.9.3** *P* **393** *L* **40** # 612

Palkert, Thomas Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

All impedance values should be 92.5 ohms

SuggestedRemedy

Change reference impedance to 92.5 ohms

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.9.3** *P* **393** *L* **40** # 64

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The reference impedance for measurement should align with the test fixture reference.

SuggestedRemedy

Change line to:

The reference impedance for differential specifications is 92.5 ohms. The reference impedance for common-mode specifications is 23.125 ohms.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.9.4** *P* **394** *L* **18** # 619

Palkert, Thomas Samtec, Macom

Comment Type **TR** *Comment Status* **R** *(Electrical) ERL*

Improve ERL specification

SuggestedRemedy

Presentation to be provided

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179** *SC* **179.9.4** *P* **394** *L* **25** # 735

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *(Electrical) CR host classes*

Bad names HL HN HH because H and L are ambiguous: loss or performance or length? Which loss?

SuggestedRemedy

Change to A B C, with A for best

Response *Response Status* **U**

REJECT.
The current names were included in the baseline proposal for passive copper cables, <https://www.ieee802.org/3/dj/public/23_11/tracy_3dj_01a_2311.pdf>. The proposal, excluding nomenclature, was adopted by motion #11 in the November 2023 meeting, see <https://www.ieee802.org/3/dj/public/23_11/minutes_3cwdfdj_2311_approved.pdf#page=26>.
The host class names from the baseline proposal were subsequently adopted by the response to comment #191 against D1.1. See <https://www.ieee802.org/3/dj/comments/D1p1/8023dj_D1p1_comments_final_clause.pdf#page=82>. They appear in multiple places in the draft and in several presentations. Changing the naming scheme at this point would be disruptive.
The existing names are indicative of insertion loss (Low, Nominal, High).

There is no consensus to make the proposed changes.

Cl **179** *SC* **179.9.4** *P* **394** *L* **37** # 736

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *(Electrical) SNDR*

Difference signal-to-noise-and-distortion ratio, dSNDR is too arcane and not justified for CR where the compliance board is properly defined and adjustment for its deviation is allowed

SuggestedRemedy

Change to SNDR, or delete and use EECQ

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #481.

Cl **179** *SC* **179.9.4** *P* **394** *L* **46** # 370

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(Electrical) CR host classes*

Reference to host classes missing

SuggestedRemedy

Please reference table 179A-1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The existence of three host classes is stated in the overview subclause, 179.1, including the fact that they have different electrical specifications.
Table 179A-1 (mentioned in the suggested remedy) is not a definition of host classes - it only includes recommendations for insertion losses, and is informative. It is not a helpful reference.

In 179.1, add a reference to Annex 179A after the host classes are first mentioned.

Implement with editorial license.

Cl **179** *SC* **179.9.4.1.1** *P* **395** *L* **47** # 651

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket)*

"For each configuration of the transmit equalizer" is not well defined, as no list of required configurations has been mentioned.

SuggestedRemedy

Clarify

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The calculation specified in 179.9.4.1.1 is for a specific configuration of the transmit equalizer, so "for each" is not adequate.
Delete the words "For each configuration of the transmit equalizer" from the second paragraph of of 179.9.4.1.1, and append the words "for a specific configuration of the transmit equalizer setting" to the first paragraph.
Implement with editorial license.

Cl **179** *SC* **179.9.4.1.1** *P* **396** *L* **1** # 652

Swenson, Norman — Nokia, Point2

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket)*

"Compute the linear fit pulse response" using what setting for the equalizer? This is not clear.

SuggestedRemedy

Clarify

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #651.

Cl **179** *SC* **179.9.4.5** *P* **399** *L* **1** # 737

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *(Electrical) SNDR*

Difference signal-to-noise-and-distortion ratio, dSNDR too arcane and not justified for CR where the compliance board is properly defined and adjustment for its deviation is allowed

SuggestedRemedy

Change to SNDR, or delete and use EECQ

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #481.

Cl **179** *SC* **179.9.4.5.1** *P* **400** *L* **4** # 740

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **R** *(Electrical) (bucket) SNDR*

Downsampling for P_Signal in SNDR seems fussy and unecessary

SuggestedRemedy

Remove it

Response *Response Status* **C**

REJECT.
The comment does not provide sufficient justification to support the suggested remedy.
The suggested remedy does not provide sufficient detail to implement.

Cl **179** *SC* **179.9.4.5.3** *P* **400** *L* **30** # 481

Healey, Adam — Broadcom, Inc.

Comment Type **T** *Comment Status* **A** *(Electrical) SNDR*

It has been demonstrated that the reference SNDR is a weak function of the test fixture s-parameters. This suggests that the SNDR test can be greatly simplified by specifying a fixed set of reference values that are a function of the preset. The reference values should be derived from the equivalent SNDR produced by the COM transmitter model under similar conditions.

SuggestedRemedy

Replace the dSNDR procedure with a comparison of the measured SNDR to a limit that is a function of the preset. Set the limits to the SNDR^(ref) values on slide 5 of <https://www.ieee802.org/3/dj/public/24_11/healey_3dj_01_2411.pdf> for presets 1 to 5. Set the limit to 31 dB for preset 6. Add a note that the limits are consistent with parameter values in the corresponding COM table. If desired, the subclause defining reference SNDR can be retained as documentation of the procedure used to define the limits.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
There are several comments related to SNDR/dSNDR.

The CRG reviewed slides 14-17 of <https://www.ieee802.org/3/dj/public/25_07/ran_3dj_01a_2507.pdf>.

Implement the changes on slides 17 of ran_3dj_01a_2507 with editorial license.

Cl **179** *SC* **179.9.4.6** *P* **401** *L* **36** # 527

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *(Electrical) (bucket) jitter*

Poor wording. Obviously the transmitter output of the lane under test shouldn't be disabled but it would be better to be more precise.

SuggestedRemedy

Change "transmitter output is" to transmitter outputs of the lanes not under test are"

Response *Response Status* **C**

ACCEPT.

Cl **179** *SC* **179.9.4.7** *P* **403** *L* **2** # 597

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The ERL of a transmitter at TP2 is defined without a reference impedance. The implied reference impedance is inferred from 179.9.3, 100-ohm. The use of a 100-ohm reference impedance for ERL is not consistent throughout D2P0.

SuggestedRemedy

Add definition of a 92.5-ohm reference impedance for the ERL computation, consistent with Annex179B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.9.4.7** *P* **403** *L* **13** # 620

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The CR specification should use 92.5 ohm impedance for transmitter and Receiver ERL

SuggestedRemedy

add line in Table 179-9 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.9.4.7** *P* **403** *L* **23** # 60

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

ERL impedance should be aligned to Rd and 179B.

SuggestedRemedy

Add line:
The reference differential impedance for the test fixture ERL computation shall be 92.5 ohms.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.9.5.3** *P* **406** *L* **26** # 534

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

It should be explicit that the test pattern for Interference tolerance for CR can be precoded.

SuggestedRemedy

Add a footnote to PRBS31Q in table 179-11. Footnote to say "With precoding enabled or disabled as the receiver would select using the start-up protocol described in 179.8.9."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Precoding and PRBS31Q generation and checking are functions of the PMA. The definition of PRBS31Q in 176.7.4.2 includes optional precoding, so it is not required to add it here explicitly.
However, precoding should be available for the receiver under test, just like transmit equalizer control. It is currently not stated in the test procedure.

In 179.9.5.3.5, change from
"the device under test (DUT) configures the pattern generator transmit equalizer to the coefficient settings it would select using the start-up protocol described in 179.8.9"
to
"the device under test (DUT) configures the pattern generator transmit equalizer coefficients and precoding to the settings it would select using the training protocol described in 179.8.9"
Make similar changes in 178.9.3.4.3, 176C.6.4.5.3, and 176D.8.12.4.
Implelent with editorial license.
[CC 178, 179, 176C, 176D]

Cl **179** *SC* **179.9.5.3** *P* **406** *L* **26** # 623

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The CR specification should use 92.5 ohm impedance for interference tolerance parameters

SuggestedRemedy

add line in Table 179-11 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.9.5.3** *P* **406** *L* **39** # 744

Dawe, Piers — Nvidia

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket) ITOL*

See 179.2 for definition of block error ratio - not. 179.9.5.3.5 says "Block error ratio is defined in 174A.8."

SuggestedRemedy

Change "See 179.2 for definition of block error ratio." to "See 179.2 and 174A.8."

Response *Response Status* **W**

ACCEPT.

Cl **179** *SC* **179.9.5.3.3** *P* **407** *L* **11** # 501

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket) ITOL*

The host channel as defined in 179A.4 includes the package and connector. Listing the host channel and package separately could lead to double counting. Partial host channel model is what this is called in Table 179-16.

SuggestedRemedy

Change "using the receiver host channel, package, and device termination models" to "using the receiver partial host channel, package, and device termination models. Also in C2M on page 757 line 34.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In item a of 179.9.5.3.3, change from
"using the receiver host channel, package, and device termination models"
to
"using the receiver partial host channel, package, and device termination models".
In item a of 176D.8.12.2, change from
"using the host channel, device package, and device termination models"
to
"using the partial host channel, package, and device termination models".

Cl **179** *SC* **179.9.5.5** *P* **410** *L* **29** # 598

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The ERL of a receiver at TP3 is defined without a reference impedance. The implied reference impedance is inferred from 179.9.3, 100-ohm. The use of a 100-ohm reference impedance for ERL is not consistent throughout D2P0.

SuggestedRemedy

Add definition of a 92.5-ohm reference impedance for the ERL computation, consistent with Annex179B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.9.5.6** *P* **410** *L* **47** # 369

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *lectrical) (bucketp) RL masks*

802.3ck common mode to differential return loss frequency was up to 50 GHz

SuggestedRemedy

We should at least extend the RLdc to 67 GHz.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179** *SC* **179.11** *P* **412** *L* **23** # 621

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The CR specification should use 92.5 ohm impedance for cable assembly

SuggestedRemedy

add line in Table 179-13 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.11** *P* **412** *L* **29** # 138

Noujeim, Leesa Google

Comment Type **TR** *Comment Status* **R** *(Electrical) CA ILdd*

Ilddmin is unreasonably high.

SuggestedRemedy

Change 16dB to 13dB

Response *Response Status* **W**

REJECT.
The current value was adopted by the response to comment #521 against D1.1. See <https://www.ieee802.org/3/dj/comments/D1p1/8023dj_D1p1_comments_final_clause.pdf#page=89>.
There were no contributions that showed availability, need, or data of cable assemblies with loss lower than 16 dB.
Note that cable assembly measurements include two MCBs and their counterparts in the cable.

The comment does not provide sufficient justification to support the suggested remedy.
See also comment #529.

Cl **179** *SC* **179.11.1** *P* **412** *L* **47** # 613

Palkert, Thomas Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

All impedance values should be 92.5 ohms

SuggestedRemedy

Change reference impedance to 92.5 ohms

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.11.1** *P* **412** *L* **47** # 65

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The reference impedance for measurement should align with the test fixture reference.

SuggestedRemedy

Change line to:

The reference impedance for differential specifications is 92.5 ohms. The reference impedance for common-mode specifications is 23.125 ohms.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.11.2** *P* **412** *L* **29** # 529

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **R** *(Electrical) CA ILdd*

For CA-A the maximum loss is 19dB with a minimum loss of 16dB allowing only a 3dB range for guardbanding for measurement accuracy and manufacturing tolerance.

SuggestedRemedy

Consider changing the cable minimum loss (for all cable types) to 15dB with a consequent reduction in the Test 1 test channel insertion losses and Cable assembly insertion losses in Table 179-11 from 15.5 Min and 16.5 max to 14.5 min and 15.5 max. Also modifying Table 179A-3 replacing 16 with 15 for ILddCA,min and 13 with 12 for ILddch,min. and Figure 179A-3 (including the footnotes from 13dB to 12dB for the minimum channel loss from TP0d to TP5d and 15 instead of of 16 in the first equation footnote and 3.1 instead of 4.1 in the second equation footnote.

Response *Response Status* **C**

REJECT.
There is no evidence that a cable assembly with the proposed minimum insertion loss can be built.

See also the response to comment #138.

Cl **179** *SC* **179.11.3** *P* **412** *L* **11** # 61

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

ERL impedance should be aligned to Rd and 179B.

SuggestedRemedy

Add line:
The reference differential impedance for the test fixture ERL computation shall be 92.5 ohms.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.11.3** *P* **413** *L* **6** # 653

Swenson, Norman — Nokia, Point2

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

93A.5 does not specify how to terminate the far end of the cable when measuring ERL.

SuggestedRemedy

Specify a source impedance and a termination impedance for the ERL measurement.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following related contribution was reviewed by CRG:
https://www.ieee802.org/3/dj/public/25_07/swenson_3dj_01_2507.pdf

The definition of ERL in 93A.5 (802.3-2022) states that "PTDR(t) may be acquired directly from an appropriately filtered time domain reflectometer (TDR), or derived mathematically from measured differential scattering parameters S(f) <...>"

The reference differential impedance for cable assembly specifications is defined in 179.11.1 as 100 Ohm. This fully defines the S-parameters measurement.

Other comments suggest that the reference impedance for ERL be changed to 92.5 Ohm differential.

Add a clarification of the termination impedance, differentiating from reference impedance, where appropriate.

Cl **179** *SC* **179.11.3** *P* **413** *L* **6** # 599

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The ERL of a cable assembly at TP1 and TP4 is defined without a reference impedance. The implied reference impedance is inferred from 179.11.1, 100-ohm. The use of a 100-ohm reference impedance for ERL is not consistent throughout D2P0.

SuggestedRemedy

Add definition of a 92.5-ohm reference impedance for the ERL computation, consistent with Annex179B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.11.3** *P* **413** *L* **19** # 622

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The CR specification should use 92.5 ohm impedance for cable assembly ERL

SuggestedRemedy

add line in Table 179-14 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179** *SC* **179.11.7** *P* **415** *L* **11** # 720

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **R** *(Electrical) CR host classes*

Add 4th host class:

SuggestedRemedy

CA-A	HL	HL, HN, HH or HH2	4
	HN	HL, HN, or HH	3
	HH	HL or HN	2
	HH2	HL	1

Response *Response Status* **U**

REJECT.
There is no definition of HH2.

The comment does not indicate a problem that needs to be solved.
The comment does not provide sufficient justification to support the suggested remedy.
The proposed change does not contain sufficient detail to implement.

Cl **179** *SC* **179.11.7.1** *P* **416** *L* **27** # 237

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **R** *ctrical) Reference impedance*

Adjust COM voltage to 46.25 ohms measurement reference.

SuggestedRemedy

Change
A_vtō 0.415
A_fetō 0.415
A_netō 0.609

Response *Response Status* **C**

REJECT.

There are several comments related to the reference impedance. The editorial team will prepare a proposal for resolving all these comments.

This comment seems to assume that the measurement of v_f is done on a load of 46.25 Ohm single-ended and therefore to obtain the specified limits from the reference transmitter the values need to change. However, there is no proposal to specify measurement on a 46.25 Ohm load.

See also the response to comment #63.

Cl **179** *SC* **179.11.7.1** *P* **417** *L* **8** # 373

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **R** *(Electrical) CR host classes*

Table 179-17 provide partial channel for different host classes, it would be helpful to also include the losses for the 3 partial channels

SuggestedRemedy

Host Partial HL Class loss = 1.72 dB
Host partial NL Class loss = 9.4 dB
Host partial HH Class loss = 14.35 dB
If one adds the MCB loss of 3.2 dB to the above value then that would give host channel see below and similar to Table 179A-1
Host HL Class loss = 4.9 dB
Host NL Class loss = 9.4 dB
Host HH Class loss = 14.35 dB
The above losses are the not max or min losses, some explanation why value in table 179-17 are chossen would be helpfull.
For the HH case if we go with Zp=140 mm will result in loss of 18.3 dB when MCB is included which inline to max loss in table 179A-1.

Response *Response Status* **U**

REJECT.

Slide 37 in the following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_07/ran_3dj_01b_2507.pdf

The comment suggests adding the ILdd values corresponding to the partial host channel of each host class. That could be done by adding another row in Table 179-17.
However, the ILdd value is just a result of the existing information in the table, and is not a specification by itself. Thus, this row would only be informative. Moreover, it would not represent the whole host channel and thus would not be helpful for implementers (and might cause confusion).
The NOTE below the table includes references to the informative annexes where the recommended host channel ILdd values are listed.

Some further information might be helpful. However, detailed proposal is required.

Cl **179** *SC* **179.11.7.1** *P* **417** *L* **8** # 372

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(Electrical) CR host classes*

The only place that host classes are defined is in Table 179A-1

SuggestedRemedy

Need reference to table 179A-1 or Host classes should be added to the glossary

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #370.

Cl **179** *SC* **179.11.7.1** *P* **417** *L* **21** # 257

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, quantization noise parameters should be added to Table 179-18.

SuggestedRemedy

Add two quantization noise parameters with suggested values to the table. Please refer to slide 16 of the accompanying document for the proposed change.
Also, see shakiba_3dj_elec_01_250626.pdf.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **179** *SC* **179.11.7.1** *P* **418** *L* **18** # 256

Shakiba, Hossein — Huawei Technologies Canada

Comment Type **TR** *Comment Status* **A** *rical) COM quantization noise*

Following first comment, an updated value for One-sided noise spectral density in Table 179-18 is needed.

SuggestedRemedy

Change One-sided noise spectral density parameter value in the table (page 418, line 18).
Please refer to slide 16 of the accompanying document for the proposed change.
Also, see shakiba_3dj_elec_01_250626.pdf.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #243.

Cl **179A** *SC* **179A.4** *P* **818** *L* **53** # 657

Swenson, Norman — Nokia, Point2

Comment Type **TR** *Comment Status* **A** *ctrical) (bucket) Link Diagram*

The Range(dB) for Host-High (HH) should be 4.45 to 18.95.

SuggestedRemedy

Change 18.5 to 18.95

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The existing number is a typo.
Implement the suggested remedy.

Cl **179A** *SC* **179A.5** *P* **819** *L* **8** # 509

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

Figure 179A-3 does not show the maximum insertion loss of the cable assembly assembly and maximum insertion loss of the cable. There is no illustration of this as there are multiple combinations possible and the maximum values of all the items listed is not simultaneously allowed.

SuggestedRemedy

Change "and is illustrated in Figure 179A-3" to "and is illustrated for the HN to HN channel in Figure 179A-2"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The first reference to Figure 179A-3 in the second paragraph of 179A.5 is incorrect, since the text describes the maximum insertion loss, but the figure shows the minimum loss budget, which is described later in the paragraph (the second reference is correct).
Delete the first instance of "and illustrated in Figure 179A–3" and insert the following sentence instead: "An example of the channel loss allocation for the HN-to-HN link configuration is illustrated in Figure 179A-2".
Delete the final sentence "The HN-to-HN link configuration is illustrated in Figure 179A–2."
Implement with editorial license.

Cl **179A** *SC* **179A.7** *P* **822** *L* **13** # 510

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **A** *(Electrical) (bucket)*

Figure 179A-3 does not show that Device package models are included in the TP0d and TP5d channels and there are no such things as TP0d and TP5d channels which are test point.

SuggestedRemedy

Either delete the sentence "Device package models are included in the TP0d and TP5d channel (Figure 179A–3);" or replace it with "Device package models are included in the TP0d to TP5d channel (Figure 179-2)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The fact that the TP0d-TP5d channel includes the packages does not need to be accompanied by a figure. These test points are referenced many times in Annex 179A. However, their definition is in 179.8.1 and is not explicitly referenced.

In 179A.7, change
"Device package models are included in the TP0d and TP5d channel (Figure 179A–3)"
to "Device package models are included in the TP0d-to-TP5d channel".
In 179A.1, change
"TP0d and TP5d test points are illustrated in the 200GBASE-CR1, 400GBASE-CR2, 800GBASE-CR4, and 1.6TBASE-CR8 link block diagram of Figure 179–2"
to "TP0d and TP5d are defined in 179.8.1 and illustrated in Figure 179–2".

Cl **179B** *SC* **179B** *P* **823** *L* **39** # 602

Kocsis, Sam Amphenol

Comment Type **ER** *Comment Status* **A** *(Electrical) (bucket)*

Flip the order of polynomial from decreasing to increasing to align formatting with older clauses.

SuggestedRemedy

Impacted equations: 179B-1, -2, -3, -4, -5

Response *Response Status* **W**

ACCEPT.

Cl **179B** *SC* **179B.1** *P* **823** *L* **22** # 514

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *ctrical) Reference impedance*

The reference impedances for measuring the test fixtures is not listed except for the ERL (where it is 92.5 Ohm differential)

SuggestedRemedy

Add the sentence (or a reference impedance subsection) stating "The reference impedance for differential specifications is 92.5 ohms and the reference impedance for common-mode specifications is 25 Ohms unless specified otherwise. Consider using 92.5 Ohm instead of 100 Ohm for the differential measurements

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #63.

Cl **179B** *SC* **179B.2.1** *P* **823** *L* **39** # 328

Brown, Matt Alphawave Semi

Comment Type **E** *Comment Status* **A** *(Electrical) (bucket)*

Variable subscripts should be normal font rather than italic font unless the subscript represents another variable, e.g. an index, f_i where i is and index variable.

SuggestedRemedy

Change variable subscripts to normal font where appropriate through Annex 179B.

Response *Response Status* **C**

ACCEPT.

Cl **179B** *SC* **179B.2.1** *P* **824** *L* **12** # 659

Swenson, Norman Nokia, Point2

Comment Type **ER** *Comment Status* **A** *trical) (bucket) CR test fixture*

Curve label is inconsistent with the text.

SuggestedRemedy

Change ILdd_{catf} to ILdd_{catfref}

Response *Response Status* **W**

ACCEPT.

Cl **179B** *SC* **179B.4.2** *P* **826** *L* **19** # 624

Palkert, Thomas — Samtec, Macom

Comment Type **TR** *Comment Status* **A** *ctrical) Reference Impedance*

The CR specification should use 92.5 ohm impedance for MTF ERL

SuggestedRemedy

add line in Table 179B-1 to specify 92.5 ohm impedance

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #63.

Cl **179B** *SC* **179B.4.2** *P* **826** *L* **34** # 515

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **R** *ctrical) Reference impedance*

It has been stated that making test fixtures that are 92.5 Ohm differential impedance throughout their length is not feasible and sections of the fixtures near the RF connectors need to be 100 Ohm which degrades this ERL measurement resulting in a need for a more relaxed specification. However it is important that the mating interface to the DUT is close to the 92.5 Ohm value.

SuggestedRemedy

Consider adding an additional Mated test fixture ERL specification with a tighter value but with the length of the reflection signal reduced and the Time gated propagation delay set to a non-zero value. It may be necessary to have different settings for the different directions of the measurement.

Response *Response Status* **C**

REJECT.
The suggested remedy does not contain sufficient detail so that the CRG can understand the specific change being suggested.

Cl **179B** *SC* **179B.4.6** *P* **829** *L* **26** # 517

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *(Electrical) (bucket)*

Incomplete sentence (no verb)

SuggestedRemedy

Change "voltage determined" to "voltage is determined"

Response *Response Status* **C**

ACCEPT.

Cl **179B** *SC* **179B.4.6** *P* **830** *L* **14** # 518

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *(Electrical) (bucket)*

missing letter

SuggestedRemedy

change "th" to "the"

Response *Response Status* **C**

ACCEPT.

Cl **179B** *SC* **179B.4.6** *P* **830** *L* **14** # 544

Schreiner, Stephan — Rosenberger Hochfrequenztechnik GmbH & Co. KG

Comment Type **E** *Comment Status* **A** *(Electrical) (bucket)*

missing "e" at the end of "the"

SuggestedRemedy

change "th" to "the"

Response *Response Status* **C**

ACCEPT.

Cl **179C** *SC* **179C.2.1** *P* **839** *L* **45** # 483

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

Comment Type **TR** *Comment Status* **A** *(Common) MDI References*

Editor's Note states the following:
The reference for SFP224 does not currently include 200G per lane specifications but it's expected to include before publication of this standard.
It is not clear that the referenced SFP224 specification will include 200G per lane specifications.
The current state of development in SFF-1031 or SFP-DD is unclear.
The IEEE P802.3dj standard could not be approved in this state.
Similar comment for 179C.2.2, 179C.2.3

SuggestedRemedy

Two options are offered, as the state of development in noted organizations is unclear.
1. If development is underway in noted organizations, modiffy the note to indicate that if the specification is not received for consideration by the Task Force by Jan 2026, the note will be removed and the MDI will be noted in a non-specific manner.
2. Remove any references to the SFF specification and make the section generic.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The comment identifies an issue regarding the completeness of the references to the MDI connector types defined in Annex 179C.

For each of the references noted in the comment, add the following editor's note:
"When this draft was published this reference was not available. If this reference is not available for review by the P802.3dj Task Force prior to the January 2026 IEEE 802.3 interim meeting then the reference will be deleted and related MDI specifications will be deleted or appropriately modified (proposal required)."

Put this note in 179C.2.1, 179C.2.2, 179C.2.3, as well as for the related references in subclause 1.3.

Implement with editorial license.

Cl **180** *SC* **180.5.12** *P* **437** *L* **28** # 193

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 180.5.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **180** *SC* **180.6** *P* **437** *L* **35** # 521

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *(Optical) (bucket)*

The positioning and ordering of the lanes at the MDI is not specified in 180.9.

SuggestedRemedy

Change the reference from 180.9 to 180A.4

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.7.1** *P* **438** *L* **51** # 425

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *(Common) Jitter*

Transmitter jitter specifications are required for optical PMDs. Clock jitter, especially at low frequencies, are not captured adequately by existing specifications, and should be limited by specifications to avoid correlated errors in receivers that would degrade link performance.

A presentation with more details is planned, but the suggested remedy contains a summary of the suggested changes.

SuggestedRemedy

In Table 180-7, add an "Output jitter" row with parameters, values, and units as in Table 176D-3 (module output specifications at TP4).

In Table 180-14, add an "Output jitter" row with pattern 4 or 6, and reference to 180.9.14 (new subclause).

Add a new subclause 180.9.14 for Output jitter. The content is to be taken from 176D.8.9, with additional exceptions:
- transmit equalizer is fixed
- when the PHY includes an xAUI-n, the clock source for the test pattern is derived from the clock recovered from the xAUI-n input signal.

Implement with editorial license.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **180** *SC* **180.7.2** *P* **440** *L* **33** # 391

Rodes, Roberto — Coherent

Comment Type **TR** *Comment Status* **R** *(Common) Block error ratio*

The receiver sensitivity specification currently relies on a complex block error ratio calculation. However, the methodology is unclear regarding the required test duration to meet the specification, and it lacks guidance on how to perform a 'statistical projection'. As receiver sensitivity is a primary specification for a PMD receiver, its test and verification procedures should be clear and practical to execute, while ensuring a reasonable level of confidence. Supporting presentation will be provided

SuggestedRemedy

replace note c by:"Measured using the conformance test signal at TP3 (refer to Section 180.8), with an error ratio allocation one decade lower than specified in 174A.12 for PMD-to-PMD." Apply also to clauses 181, 182 and 183

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **180** *SC* **180.8.3** *P* **444** *L* **47** # 194

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Optical) (bucket)*

DR MDIs use pairs of fibers

SuggestedRemedy

Change "...besides the option to connect to a single fiber MDI, ..." to "…besides the option to connect to a single fiber-pair MDI, …"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #134.

Cl **180** *SC* **180.8.3** *P* **444** *L* **47** # 134

Parsons, Earl — CommScope

Comment Type **T** *Comment Status* **A** *(Optical) (bucket)*

The phrase "option to connect to a single fiber MDI" is incorrect since there are two fibers in that MDI.

SuggestedRemedy

Change "For 200GBASE-DR1, besides the option to connect to a single fiber MDI, there are two additional specified MDI optical receptacles, a single-row 12-fiber interface and a single-row 16 fiber interface."

to

"For 200GBASE-DR1, besides the option to connect to an MDI with two fibers, there are two additional specified MDI optical receptacles, a single-row 12-fiber interface and a single-row 16 fiber interface."

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.1** *P* **445** *L* **31** # 530

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

PRBS31Q with pre-coding should be listed as a possible test pattern. Also it would be better to reference the description of the 200G per lane PRBS31Q test pattern in 176.7.4.2 rather than the older reference in

SuggestedRemedy

Add PRBS31Q with precoding as an additional test pattern (8) in table 180-13. In table 180-14 add this pattern as an option wherever patter 3 is used. The reference for the test pattern definition should be 176.7.4.2. Change the test pattern generator generator for PRBS31Q from 120.5.11.2.2 to 176.7.4.2. Make equivalent changes to Clause 181.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment points out that the reference for the PRBS31Q (pattern 3) test pattern should be 176.7.4.2. The same applies to the square wave (176.7.4.6), PRBS13Q (176.7.4.3), and SSPRQ (176.7.4.5) patterns.

The comment also correctly points out that there is no direction to provide precoding to pattern 3 or pattern 5 (scrambled idle) when required by the receiver.

The comment proposes to address this by adding a new pattern: <PRBS31Q with precoding>. However, a new pattern <scrambled idle with precoding> would also be required, as well.

In operation, precoding is requested as enabled or disabled through the ILT process. Further, given that ILT is mandatory, a receiver might rely upon the ILT process (e.g., starting with a particular training frame pattern) to achieve the best performance. Regardless, a statement is needed in 180.9.12 and 180.9.13 about applying precoding when needed/requested by the receiver.

Change the references for the test patterns as noted above in Table 180-13 and Table 181-11.

Also, add a footnote to Pattern 3 and 5 pointing out that addition precoding may be added pointing to 176.7.1.2 as well as the receiver sensitivity and stressed receiver sensistivity subclauses.

In 180.9.12, 180.9.13, 181.9.12, and 181.9.13, add a statement that precoding, as provided by the PMA, is enabled if requested by the receiver. Also include a reference to 176.7.1.2 which defines precoding.

Add the following sentence in 180.9.12, 180.9.13, 181.9.12, and 181.9.13
"Precoding (see 176.7.1.2) shall be enabled if the receiver requests precoding during ILT."

Implement with editorial license.

Cl **180** *SC* **180.9.5** *P* **448** *L* **25** # 320

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(Common) taps (bucket)*

Table 180-15 footnote a is out of sync with the table. Coefficients are labelled as being normalized, thus saying they are relative to c(0) is redundant. However, it is not stated what normalized means. The table already associates "main tap" with c(0) on row 4.

SuggestedRemedy

Change footnote a to: "The normalized tap coefficients are relative to c(0)."
Implement also in Table 181-13, Table 182-15, and Table 183-14.

Response *Response Status* **C**

ACCEPT.

Cl **180** *SC* **180.9.5** *P* **448** *L* **27** # 321

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **A** *(Common) taps (bucketp)*

Regarding Table 180-15 footnote b… The table specifies an non-normalized range for c(0) and normalized values for the other coeffecients. It is not immediately clear whether to sum the normalized or non-normalized coeffecients.

SuggestedRemedy

Change footnote b to: "Equalizer gain is the sum of the non-normalized coefficients." or similar.
Implement also in Table 181-13, Table 182-15, and Table 183-14.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Three changes to table 180-15:
#1 Beside "normalized equalizer coefficient limits" change "c(i)" to "c(i)/c(0)".
#2 Change "Equalizer gain" to "Equalizer DC gain".
#3 Footnote a "The sum of all 15 equalizer coefficients, c(i)"

Implement similarly also in Table 181-13, Table 182-15, and Table 183-14.
Implement with editorial license.

Cl **180** *SC* **180.9.6** *P* **449** *L* **14** # 322

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **A** *(Optical) (bucket)*

Use of possesive grammar is inconsistent with similar phrases used through this draft and is unecessary here.

SuggestedRemedy

Change "transmitter's" to "transmitter"
Also page 472 line 38, page 499 line 16, page 523 line 46.

Response *Response Status* **C**

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

Cl **180** *SC* **180.9.12** *P* **450** *L* **38** # 531

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

Whether the precoding is used for Receiver sensitivity and stressed receiver sensitivity should be explicitly stated.

SuggestedRemedy

On line 38 inset the setence . "A precoded pattern shall be used if the receiver requests precoding during ILT." between "….. Table 180-14" and "The …." Also after Table 180-14 on line 2 of page 451. Make equivalent changes to Clause 181.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #530.

Cl **180A** *SC* **180A** *P* **850** *L* **4** # 51

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

Comment Type **ER** *Comment Status* **R** *(Optical) Annex title (bucket)*

The title of the Annex is incorrect. This annex only addresses MDIs for the DR family of optics.

SuggestedRemedy

Change title to "MDIs for 200GBASE-DR1, 400GBASE-DR2, 800GBASE-DR4, 1.6TBASE-DR8, 200GBASE-DR1-2, 400GBASE-DR2-2, 800GBASE-DR4-2, and 1.6TBASE-DR8-2

Response *Response Status* **W**

REJECT.

The comment proposes to re-introduce the title from D1.4.

Comment #19 to D1.4 stated “The title of this annex is very long and not future-proof. Instead make title generic define the scope in a scope clause to limit to 3dj PHYs. Note that a similar approach is used in Annex 174A.” with suggested remedy “Change Annex title to: "MDIs for optical PHYs" Change the title of 180A.1 to "Scope". Add the following new subclause heading after the the first paragraph: "180A.2 Overview" encompassing the second paragraph and Table 180A-1.” The resolution to comment #19 was “Accept in principle”: Implement suggested remedy with editorial license.

The rationale provided in the comment #19 applies to this new comment.

Cl **181** *SC* **181.5.12** *P* **460** *L* **24** # 195

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 181.5.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **181** *SC* **181.7.1** *P* **462** *L* **19** # 429

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *(Common) TDECQ (bucket)*

Table 181-5 has a sub-row of OMA_outer (min): "for TDECQ<0.9 dB"

Shouldn't it be "for max(TECQ, TDECQ)<0.9 dB", as in the similar rows in Table 180-7, Table 182-7, and Table 183-6?

SuggestedRemedy

Change to "for max(TECQ, TDECQ)<0.9 dB".

Response *Response Status* **C**

ACCEPT.

Cl **181** *SC* **181.7.1** *P* **462** *L* **39** # 426

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *(Common) Jitter*

Transmitter jitter specifications are required for optical PMDs. Clock jitter, especially at low frequencies, are not captured adequately by existing specifications, and should be limited by specifications to avoid correlated errors in receivers that would degrade link performance.

A presentation with more details is planned, but the suggested remedy contains a summary of the suggested changes.

SuggestedRemedy

Refer to my similar comment against 180.7.1, implement the corresponding changes in Clause 181, with editorial license.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **181** *SC* **181.7.3** *P* **465** *L* **45** # 143

Lambert, Angela — Corning

Comment Type **E** *Comment Status* **A** *(Optical) (bucket)*

Cabled fiber attenuation and fiber attenuation are different. As noted at the footnote of other link power budget tables (i.e. Table 180-9 on p. 441 and Table 182-9 on p. 491) and in the respective Optical fiber and cable characteristics tables (in this case, Table 181-9 on page 467), this should be "Cabled optical fiber attenuation"

SuggestedRemedy

Change "fiber attenuation" to "cabled optical fiber attenuation"

Response *Response Status* **C**

ACCEPT.

Cl **181** *SC* **181.8.3** *P* **468** *L* **45** # 522

Dudek, Mike — Marvell

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

It would be good to provide a reference to Annex 180A in this section.

SuggestedRemedy

Add a paragraph similar to that in the equivalent section of clause 180. "Annex 180A specifies the details of the MDIs for 200GBASE-DR1-2, 400GBASE-DR2, 800GBASE-DR4-2,
and 1.6TBASE-DR8-2."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **181** *SC* **181.8.3** *P* **468** *L* **46** # 524

Dudek, Mike — Marvell

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

Lines 47 to 54 on page 444 in clause 180 provide details of the MDI that also apply to the clause 181 MDI's. Specifying which connectors should be used.

SuggestedRemedy

Either add this information in clause 181.8.3 or move that information into Annex 180A.3

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **182** *SC* **182.5.12** *P* **487** *L* **41** # 196

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 182.5.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **182** *SC* **182.7.1** *P* **489** *L* **25** # 427

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *(Common) Jitter*

Transmitter jitter specifications are required for optical PMDs. Clock jitter, especially at low frequencies, are not captured adequately by existing specifications, and should be limited by specifications to avoid correlated errors in receivers that would degrade link performance.

A presentation with more details is planned, but the suggested remedy contains a summary of the suggested changes.

SuggestedRemedy

Refer to my similar comment against 180.7.1, implement the corresponding changes in Clause 182, with editorial license.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **182** *SC* **182.8.3** *P* **494** *L* **52** # 135

Parsons, Earl — CommScope

Comment Type **T** *Comment Status* **A** *(Optical) (bucket)*

The phrase "option to connect to a single fiber MDI" is incorrect since there are two fibers in that MDI.

SuggestedRemedy

Change "For 200GBASE-DR1, besides the option to connect to a single fiber MDI, there are two additional specified MDI optical receptacles, a single-row 12-fiber interface and a single-row 16 fiber interface."

to

"For 200GBASE-DR1, besides the option to connect to an MDI with two fibers, there are two additional specified MDI optical receptacles, a single-row 12-fiber interface and a single-row 16 fiber interface."

Response *Response Status* **C**

ACCEPT.

Cl **182** *SC* **182.8.3** *P* **494** *L* **52** # 197

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Optical) (bucket)*

DRn-2 MDIs use pairs of fibers.

SuggestedRemedy

Change "...besides the option to connect to a single fiber MDI, ..." to "…besides the option to connect to a single fiber-pair MDI, …"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #135.

Cl **183** *SC* **183.1** *P* **505** *L* **48** # 93

Bruckman, Leon — Nvidia

Comment Type **ER** *Comment Status* **A** *(Optical) (bucket)*

Wrong singular in note c

SuggestedRemedy

In note c change: "If one or two 800GAUI-n is implemented"
To: "If one or two 800GAUI-n are implemented"

Response *Response Status* **W**

ACCEPT.

Cl **183** *SC* **183.5.12** *P* **510** *L* **33** # 417

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **A** *(Common) ILT local_pattern*

In order to bring up a link that includes multiple ISLs, the functionality of ILT as specified by Annex 178B (specifically Figure 178B–7 and Figure 178B–8) is required across ISLs.

In PMDs that have a training protocol but it's disabled, the "quiet" and "local pattern" modes are the method of communicating the RTS to the peer. However, the local pattern is currently not defined.

SuggestedRemedy

Specify that PRBS31 encoded by Inner FEC as defined in 177.6.1.1 (which may be generated by the inner FEC sublayer) is the pattern used when mr_training_enable is false and tx_mode has the value local_pattern (see 178B.14.3.1).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #416.

Cl **183** *SC* **183.5.12** *P* **510** *L* **33** # 198

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 183.5.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **183** *SC* **183.7.1** *P* **512** *L* **50** # 428

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *(Common) Jitter*

Transmitter jitter specifications are required for optical PMDs. Clock jitter, especially at low frequencies, are not captured adequately by existing specifications, and should be limited by specifications to avoid correlated errors in receivers that would degrade link performance.

A presentation with more details is planned, but the suggested remedy contains a summary of the suggested changes.

SuggestedRemedy

Refer to my similar comment against 180.7.1, implement the corresponding changes in Clause 183, with editorial license.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **183** *SC* **183.7.3** *P* **515** *L* **44** # 144

Lambert, Angela — Corning

Comment Type **E** *Comment Status* **A** *(Optical) (bucket)*

Cabled fiber attenuation and fiber attenuation are different. As noted at the footnote of other link power budget tables (i.e. Table 180-9 on p. 441 and Table 182-9 on p. 491) and in the respective Optical fiber and cable characteristics tables (in this case, Table 183-10 on page 518), this should be "Cabled optical fiber attenuation"

SuggestedRemedy

Change "fiber attenuation" to "cabled optical fiber attenuation"

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.2** *P* **533** *L* **4** # 199

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

It is misleading to present the reordering and deskew functions as optional. The lanes are required to be in the two flow groups (0-15 and 16-31) and deskewed to a 2-symbol boundary. In an implementation that happens to have the inner FEC immediatley next ot the PCS, this may not require any effort, because the PCS will have created the lanes in order and there won't be any skew to remove, but that doesn't make the process optional from a standardization perspective. There are always design optimizations that can be made that we don't spell out as optional functions.

SuggestedRemedy

Replace "If necessary, the lanes are reordered and deskewed" with "The lanes are reordered and deskewed."

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.2** *P* **533** *L* **18** # 201

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Awkward grammar : "Convolutional interleaving and permutation are undone to restore the original lanes order".

SuggestedRemedy

Reword as: "Convolutional interleaving and permutation are undone to restore the original order of the lanes".

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.4.1** *P* **534** *L* **5** # 202

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

It is required that the lanes be in the two flow groups and deskewed to a 2-symbol boundary. If the PCS and Inner FEC happen to be adjacent, a designer may be able to omit these functions, but that doesn't make them optional from a standardization perspective

SuggestedRemedy

Change "The alignment lock and deskew functions, when implemented, shall be…" to "The alignment lock and deskew functions shall be …"

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.4.3** *P* **535** *L* **2** # 203

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

Figure 184-3 could be more clear. The labels "RS-FEC in" and "RS-FEC out" are really the values of the index i (mod 4). The permutation isn't doing anything with the symbols in flows 16-31 in columns 0 and 1; they stay where they are. It's the symbols in columns 2 and 3 that are changing to create symbol quartets with one symbol from each RS FEC encoder.

SuggestedRemedy

Replace the "RS-FEC in" and "RS-FEC out" labels with "Symbo index i mod 4". Change the left side of the figure to have one box around columns 2 and 3, rows 16-31, and a different style of box around columns 2 and 3, rows 0-15. Change the right hand side of the figure to show that the top and bottom boxes in clumns 2 and 3 from the left hand side have changed positions.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Figure 184-3 is an example as indicated in the text above it. The labels are self explanatory, replacing them may create more confusion and adding "mod 4" is not necessary since this is one example.
Change the left side of the figure to have one box around columns 2 and 3, rows 16-31, and a different style of box around columns 2 and 3, rows 0-15. Change the right hand side of the figure to show that the top and bottom boxes in columns 2 and 3 from the left hand side have changed positions.

Cl **184** *SC* **184.4.5** *P* **537** *L* **7** # 204

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

m(x) should have the m in italics

SuggestedRemedy

Italicize the m

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.4.7** *P* **537** *L* **50** # 205

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Up until this point, the index q has been used for the 32 flows within the inner FEC. It is confusing to use q here as the index for the 4 output flows of the BCH interleaver.

SuggestedRemedy

Choose a different index for the 4 flows of intero[]

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement with editorial license.

Cl **184** *SC* **184.4.7** *P* **537** *L* **51** # 206

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The index l should be avoided if at all possible, as it can be confused for the number 1.

SuggestedRemedy

Pick a different letter to use for this index.

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.5.8** *P* **544** *L* **12** # 94

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

This section describes the deinterleaver, not the interleaver

SuggestedRemedy

Change: "the convolutional interleaver process" to: "the convolutional deinterleaver process"

Response *Response Status* **W**

ACCEPT.

Cl **184** *SC* **184.7.2.2** *P* **547** *L* **2** # 637

Law, David HPE

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

I believe that the e DSP frame lock state diagram requests a SYM_SLIP, not a SLIP (see the SYM_SLIP state in Figure 184–9—DSP 'lock state diagram'.

SuggestedRemedy

Suggest that '... the SLIP requested by the DSP frame lock state ...' should be changed to read '... the SYM_SLIP requested by the DSP frame lock state ...'.

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.10** *P* **551** *L* **47** # 572

Nicholl, Shawn AMD

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

In the "MDIO register/bit number" column of the Inner_FEC_codeword_error_bin_0 row of "Table 184-5 -- Inner FEC status variables and MDIO mapping", the MDIO bit indices are unnecessarily mentioned.

There are only 16 bits in an MDIO register, thus "15:0" is implied and does not need to be mentioned. Also, other rows (eg. test_block_error_bin_0_16p) of the same table don't include the "15:0". Also, Table 177-8 excludes the "15:0" for the exact same MDIO registers.

SuggestedRemedy

Propose "MDIO register/bit number" column of the Inner_FEC_codeword_error_bin_0 row of "Table 184-5 -- Inner FEC status variables and MDIO mapping", contain "1.2424," and "1.2425" on two lines.

Same comment for Inner_FEC_codeword_error_bin_1 through Inner_FEC_codeword_error_bin_4.

Response *Response Status* **C**

ACCEPT.

Cl **184** *SC* **184.11.4.1** *P* **554** *L* **18** # 207

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The signal presented to the permutation function must have the properties that the lane grouping and deskew functions provide, so the functions are mandatory (even if some implementations may not need to perform these functions, they are not optional)..

SuggestedRemedy

Change the status of these items to M

Response *Response Status* **C**

ACCEPT.

Cl **185** *SC* **185.1** *P* **556** *L* **40** # 418

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *(Common) ILT coherent*

In order to bring up a link that includes multiple ISLs, the functionality of ILT as specified by Annex 178B (specifically Figure 178B–7 and Figure 178B–8) is required across ISLs. This is true regardless of the PMD type, and even if the PMD does not use a training protocol, such as 800GBASE-LR1.

In PMDs that don't have a training protocol, the "quiet" and "local pattern" modes are the method of communicating the RTS to the peer. However, the local pattern is currently not defined.

SuggestedRemedy

Add 178B-ILT, Required as row in Table 185-1 (as in other PMD clauses)..

Add a subclauase under 185 defining the ILT functionality; it is as specified in Annex 178B, with mr_training_enable always set to false (since 800GBASE-LR1 doesn't have a training protocol). Specify that Inner FEC encoded PRBS31 test pattern defined in 184.6.1 (which may be generated by the inner FEC sublayer) is the pattern used when tx_mode has the value local_pattern (see 178B.14.3.1).

Response *Response Status* **U**

REJECT.

The following contributions were reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_07/ran_3dj_03a_2507.pdf
https://www.ieee802.org/3/dj/public/25_07/mi_3dj_01a_2507.pdf

Per straw poll TF-3 there is significant support for providing support for end-to-end path start-up in 802.3dj coherent PMDs.

Also, straw poll TF-4 indicates support in the direction in ran_3dj_03a_2507, but more details and consensus building required.

There is no consensus to implement the proposed changes at this time.

Straw poll TF-3 (directional):
I support adding support for end-to-end path start-up in 802.3dj coherent PMDs.
Yes: 33
No: 1
Abstain: 12

Straw poll TF-4 (directional):
I support the the direction of supporting end-to-end path start-up in 802.3dj coherent PMDs proposed in ran_3dj_03a_2507.
Yes: 22
No: 2
NMI: 16
Abstain: 10

Cl **185** *SC* **185.1** *P* **556** *L* **45** # 95

Bruckman, Leon — Nvidia

Comment Type **ER** *Comment Status* **A** *(Optical) (bucket)*

Wrong singular in note c

SuggestedRemedy

In note c change: "If one or two 800GAUI-n is implemented"
To: "If one or two 800GAUI-n are implemented"

Response *Response Status* **W**

ACCEPT.

Cl **185A** *SC* **185A.1** *P* **859** *L* **16** # 335

Zimmerman, George — ADI,APLgp,Cisco,Marvell,OnSemi,Sony

Comment Type **T** *Comment Status* **R** *(Optical) ETCC (bucket)*

The annex only contains a single methodology (ETCC), and it really doesn't define the parameter - it specifies the method of calculation.

SuggestedRemedy

Replace text of 185A.1 text with: "This annex defines the method for measuring and computing the Extended transmitter constellation closure (ETCC). The ETCC is a

Response *Response Status* **C**

REJECT.
While the annex currently only defines ETCC, the intent of the annex is to contain all coherent measurement methodologies that future specifications may require so we do not want to limit the scope of the annex to ETCC only.

Cl **185A** *SC* **185A.2.5.2** *P* **865** *L* **39** # 337

Zimmerman, George — ADI,APLgp,Cisco,Marvell,OnSemi,Sony

Comment Type **T** *Comment Status* **A** *(Optical) (bucket)*

The required signal to noise ratio (in general) is not what is in equation 185A-2. Equation 185A-2 is the Required signal to noise ratio in the presence of virtual ASE. (RSNR_ase) not just RSNR.

SuggestedRemedy

change "required signal to noise ratio (RSNR)" to "required signal to noise ratio in the presence of virtual ASE (RSNR_ase)" at line 39

Response *Response Status* **C**

ACCEPT.

Cl **185A** *SC* **185A.2.5.2** *P* **865** *L* **46** # 338

Zimmerman, George ADI,APLgp,Cisco,Marvell,OnSemi,Sony

Comment Type **E** *Comment Status* **A** *(Optical) (bucket)*

DeltaRSNR_trx doesn't relate to "RSNR" in equation 185A-3, it relates to RSNR_ASE.

SuggestedRemedy

Change RSNR to RSNR_ase at line 46

Response *Response Status* **C**

ACCEPT.

Cl **185A** *SC* **185A.2.5.2** *P* **866** *L* **7** # 525

Dudek, Mike Marvell

Comment Type **E** *Comment Status* **A** *(Optical) (bucket)*

Unnecessary duplication of "waveforms"

SuggestedRemedy

Delete "as waveforms"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change
"captured waveforms as waveforms as described in Figure 185A–5"
to
"captured waveforms as described in Figure 185A–5"

Cl **186** *SC* **186.2.1** *P* **582** *L* **4** # 209

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

In the second sentence, clarify "800GBASE-ER1 FEC" is referring to the sublayer rather than the ER1 FEC code.

SuggestedRemedy

Change "800GBASE-ER1 FEC" to "800GBASE-ER1 FEC sublayer". This should be applied throughout the subclause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license

Cl **186** *SC* **186.2.1** *P* **582** *L* **19** # 210

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The "8 lanes" should not be called lanes since they are not an interface between two sublayers.

SuggestedRemedy

Change 8 lanes to "8 ER1 FEC flows" throughout the paragraph and in the last paragraph of this subclause This change also needs to be made in 186.2.3.2, 186.2.3.3, Figure 186-7, and perhaps other places

Response *Response Status* **C**

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

Cl **186** *SC* **186.2.1** *P* **582** *L* **23** # 211

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The interface between the FEC and PMA sublayers is FEC codewords, not symbols.

SuggestedRemedy

Delete "as a stream of symbols" from the end of the last sentence of the 3rd-to-last paragraph.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.1** *P* **582** *L* **30** # 212

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The interface between the FEC and PMA sublayers is FEC codewords, not digitized DP16QAM symbols.

SuggestedRemedy

Change the second clause of the second sentence from: "… the 800GBASE-ER1 FEC synchronization process accepts a stream of m-bit digitized DP-16QAM symbols via the PMA:IS_UNITDATA.indication primitive and forms a stream of ER1 FEC codewords"
to
"… the 800GBASE-ER1 FEC synchronization process accepts a stream of FEC codewords in the form of m-bit digitized bitstreams representing the four components of DP-16QAM symbols."

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.2** *P* **582** *L* **47** # 213

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The text here says the UNITDATA parameter is a symbol, whereas 186.3.2 says it is FEC codewords

SuggestedRemedy

Since the PMA includes the Gray coding and symbol mapping processes, it makes more sense to describe the service interface to the PMA as FEC codewords. Change tx_symbol and rx_symbol to tx_codeword and rx_codeword, respectively.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.3.4.1** *P* **586** *L* **28** # 215

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The AM field is defined in G.709.1, but the values used in it are in G.709.6 (as indicated in the normative text of this clause).

SuggestedRemedy

Change the note to say "Recommendation ITU_T G.709.1, Recommendation ITU-T G.709.6, and OIF-800ZR-01.0"

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.3.4.1** *P* **586** *L* **34** # 216

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The EOH field is defined in G.709.1 rather than G.709.6

SuggestedRemedy

Change G.709.6 to G.709.1.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.3.5.5** *P* **588** *L* **14** # 217

Huber, Thomas Nokia

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

The non-zero values of MAP are bytes 6 and 7 of the first row, not 6 and 8

SuggestedRemedy

Change "byte 8" to "byte 7"

Response *Response Status* **W**

ACCEPT.

Cl **186** *SC* **186.2.3.5.9** *P* **589** *L* **2** # 99

Bruckman, Leon Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Text in this paragraph can be improved

SuggestedRemedy

Change: "the test pattern is generated using the clock for the 800GBASE-ER1 tributary frame"
To "the test pattern is generated using the same clock as the one used to generate the 800GBASE-ER1 tributary frame"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Change the text to read "... the test pattern and 800GBASE-ER1 tributary frame are generated from the same clock"

Cl **186** *SC* **186.2.3.5.10** *P* **589** *L* **10** # 100

Bruckman, Leon Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Missing "the"

SuggestedRemedy

Change: "by 800GBASE-ER1 FEC" to "by the 800GBASE-ER1 FEC"

Response *Response Status* **W**

ACCEPT.

Cl **186** *SC* **186.2.3.5.10** *P* **590** *L* **14** # 242

Gorshe, Steve — Microchip Technology

Comment Type **TR** *Comment Status* **A** *(Logic) (bucket)*

Why are there 4 Stuff blocks at the beginning of the row 1 payload area in Figure 186-7? The GMP word size (granularity) in each 800GBASE-ER1 frame is one 257-bit block. As shown in Table 186-1, the first block of each 800GBASE-ER1 frame will be a GMP stuff word. Since each of the 8 lanes are mapped into their own 800GBASE-ER1 frame, and GMP mapping is performed per lane, there should be a single stuff block in the first row of Figure 186-7.

SuggestedRemedy

If this comment is correct, Figure 186-7 should be modified to begin the payload area with a single stuff block. If the four stuff blocks are correct, an explanation should be added to explain why.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The comment is correct.
Update the figure to show a single stuff block at the start of the multiframe

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Cl **186** *SC* **186.2.3.8** *P* **591** *L* **52** # 264

Wang, Xuebo — Huawei

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

"OBFG84" should be changed to "OFBG84" as OFBG is the abbreviation of OFEC block group in ITU-T G709.6.

SuggestedRemedy

Change "OBFG84" to "OFBG84".

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.4.1** *P* **594** *L* **9** # 265

Wang, Xuebo — Huawei

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The number 344064 should be 172032. Each DP-16QAM symbol represents 8 bits, then 1376256 bits should correspond to 172032 DP-16QAM symbols.

SuggestedRemedy

Change "344064" to "172032".

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.2.4.6.1** *P* **595** *L* **40** # 101

Bruckman, Leon — Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Strange character

SuggestedRemedy

Change: "multi0frame" to "multi-frame"

Response *Response Status* **W**

ACCEPT.

Cl **186** *SC* **186.2.4.9.3** *P* **597** *L* **32** # 102

Bruckman, Leon — Nvidia

Comment Type **ER** *Comment Status* **A** *(Logic) (bucket)*

Inconsistent lenguage

SuggestedRemedy

Change: "If the alignment marker location feature is supported (FEC_alignment_marker_location_ability is set to 1) and is enabled by the FEC control variable FEC_alignment_marker_location_enable (set to 1),"
To: "If the alignment marker location feature is supported (FEC_alignment_marker_location_ability is set to 1) and is enabled (FEC control variable FEC_alignment_marker_location_enable is set to 1),"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Change the text to read "If the alignment market location function is supported (FEC_alignment_marker_location_ability is set to 1) and is enabled (FEC_alignment_marker_location_enable is set to 1)"

Cl **186** *SC* **186.3.2** *P* **599** *L* **40** # 219

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

The clause describing the service interface has a large number of additional subheadings (one for each primitive, and within those, a 'semantics', 'when generated', and 'effect of receipt' subclause) compared to the FEC subclause, and compared to other service interface descriptions.in this amendment

SuggestedRemedy

Revise the clause to remove all the subheadings, most of which have only one or two sentences in them. Align the overall structure with what is in 186.2.2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Remove level 4 and level 5 headings throughout subclause 186.3.2, and update the text that remains to align with the style of service interface specification for other PMA layers (e.g. ,173, 176).
Implement with editorial license.

Cl **186** *SC* **186.3.3.2** *P* **602** *L* **51** # 267

Wang, Xuebo Huawei

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

"mfas<0:21>" should be changed to "faw<0:21>", as it is shortened from multi-frame alignment word per CL186.3.3.5.

SuggestedRemedy

Change "mfas<0:21>" to "faw<0:21>".

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.3.3.2** *P* **603** *L* **9** # 268

Wang, Xuebo Huawei

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

"S<7023:7075>" should be changed to "S<7013:7075>". Each 800GBASE-ER1 PMA frame contains 114 rows of 64 symbols per Line 46 on Page 602 in CL186.3.3.2. S<7013:7075> consists of the 63 payload symbols of row 113 leaded by the pilot symbol P113.

SuggestedRemedy

Change "S<7023:7075>" to "S<7013:7075>".

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.2.1** *P* **610** *L* **35** # 636

Law, David HPE

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

I believe that the FAW field lock state diagram requests a FAW_SLIP, not a SLIP (see the FAW_SLIP state in Figure 186–16 '800GBASE-ER1 PMA FAW field lock state diagram'.

SuggestedRemedy

Suggest that '... the SLIP requested by the FAW field lock state ...' should be changed to read '... the FAW_SLIP requested by the FAW field lock state ...'.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.3** *P* **618** *L* **17** # 661

Law, David HPE

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

Since Figure 186–18 is the '800GBASE-ER1 FEC FAM field lock state diagram', it seems that:

[1] The condition from the GET_BLOCK state to the FIND_1ST state should be test_fam.
[2] The condition from the INVALID_FAM state to the 5_BAD state should be fam_bad_count = 5.
[3] The condition from the COMP_2ND state to the 2_GOOD state should be fam_match.

SuggestedRemedy

Change:

[1] The GET_BLOCK state to the FIND_1ST state transition condition from test_amp to test_fam.
[2] The INVALID_FAM state to the 5_BAD state transition condition from amp_bad_count = 5 to fam_bad_count = 5.
[3] The COMP_2ND state to the 2_GOOD state transition condition from amp_match to fam_match.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.3** *P* **619** *L* **9** # 662

Law, David HPE

Comment Type **T** *Comment Status* **A** *(Logic) (bucket)*

The Figure 186–19 800GBASE-ER1 FEC multi-frame alignment state diagram uses the variable fec_mfas_restart, but only fec_mfas_restart_lock is defined in the associated subclause 186.4.2.1 'Variables'.

SuggestedRemedy

Either change the three instances of fec_mfas_restart to read fec_mfas_restart_lock in Figure 186–19, or change fec_mfas_restart_lock to read fec_mfas_restart in subclause 186.4.2.1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Update Figure 186-19 as suggested.

Cl **186** *SC* **186.4.3** *P* **620** *L* **4** # 663

Law, David HPE

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Subclause 186.4.1 'State diagram conventions' says 'The notation used in the state diagrams follows the conventions of 21.5.'. Table 21–1 'State diagram operators' in subclause 21.5 defines the use of the [equal sign] character as ' Equals (a test of equality)'.

SuggestedRemedy

Change the five instances of the text '... == ...' in Figure 186–20 to read '... = ...'.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.3** *P* **620** *L* **23** # 665

Law, David HPE

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Subclause 186.4.1 'State diagram conventions' says 'The notation used in the state diagrams follows the conventions of 21.5.'. Table 21–1 'State diagram operators' in subclause 21.5 defines the use of the [left arrow] character as the 'Assignment operator'.

SuggestedRemedy

Change the five instances of the use of the characters '<=' as the assignment operator in the states in Figure 186–20 '800GBASE-ER1 FEC Alignment marker location state diagram' to use the [left arrow] character.

Response *Response Status* **C**

ACCEPT.

Cl **186** *SC* **186.4.3.** *P* **620** *L* **39** # 664

Law, David HPE

Comment Type **E** *Comment Status* **A** *(Logic) (bucket)*

Subclause 186.4.1 'State diagram conventions' says 'The notation used in the state diagrams follows the conventions of 21.5.'. Table 21–1 'State diagram operators' in subclause 21.5 defines the use of the [greater than or equal sign] character as 'Greater than or equal to'.

SuggestedRemedy

Change the text 'zero_aml_cnt >= 5' to read 'zero_aml_cnt [greater than or equal sign] 5' in Figure 186–20 '800GBASE-ER1 FEC Alignment marker location state diagram'.

Response *Response Status* **C**

ACCEPT.

Cl **187** *SC* **187.5.1** *P* **634** *L* **31** # 103

Bruckman, Leon Nvidia

Comment Type **ER** *Comment Status* **A** *(Optical) (bucket)*

Text can be improved to be consistent with other similar PMD clauses

SuggestedRemedy

Change: "A block diagram for the transmit/receive paths is shown in Figure 187–3 and a block diagram of the PMD is shown in Figure 187–4." to "Thetransmit/receive paths block diagram is shown in Figure 187–3 and the PMD block diagram is shown in Figure 187–4."

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Change
"A block diagram for the transmit/receive paths is shown in Figure 187–3 and a block diagram of the PMD is shown in Figure 187–4."
to
"A block diagram for the PMD transmit/receive paths is shown in Figure 187–3 and a block diagram of the PMD is shown in Figure 187–4."

Cl **187** *SC* **187.8.6** *P* **643** *L* **44** # 336

Zimmerman, George ADI,APLgp,Cisco,Marvell,OnSemi,Sony

Comment Type **E** *Comment Status* **A** *(Optical) (bucket)*

This section says, "The method and ETCC
calculation are defined in 187.9." - but when I look at 187.9, I only find that it is computed using the test setup and calculation defined in Annex 185A. (and parameter values for the front end in Tables 187-12 and 187-13) - none of this is defines the method and calculation - it just points the reader on to another section - better point to 185A and the tables directly rather than a wild goose chase with an in between reference that just points ahead.

SuggestedRemedy

Change "The method and ETCC calculation are defined in 187.9." to "The method and ETCC
calculation are defined in 185A, using the parameters in the Tables 187-12 and 187-13."

Response *Response Status* **C**

ACCEPT.