Comment Type: T  Comment Status: R  AUI Generations (common)

In the past, we have included all previously defined AUI for each new PHY type defined. Given that the PMA multiplexing methods were consistent this was simple to support. Now that we have switched to a different PMA multiplexing method (RS-FEC symbol) things are getting more complicated.

Suggested Remedy
For each PHY new 200 Gb/s per lane or higher PHY type, include only one or two previous generations of AUI. Specifically, the new PHY types defined in 802.3dj indication only 100 Gb/s per lane and 200 Gb/s per lane AUIs as being optional within a PHY. Perhaps, also include 50 Gb/s per lane AUIs as well.

Response  Response Status: Z
REJECT.

This comment was WITHDRAWN by the commenter.

Comment Type: T  Comment Status: A  Machine Convention (bucket)

Many state diagrams in this draft as well as in the base standard use the operator "++" to indicate that the variable be incremented by 1. However, this operator is never defined.

Suggested Remedy
Import Clause 21 and Amendment 21.5 to include definition of "++.
Delete the following from state diagram conventions in multiple clauses. "The notation used in the state diagrams follows the conventions of 21.5. The notation ++ after a counter or integer variable indicates that its value is to be incremented."

Response  Response Status: C
ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Comment Type: TR  Comment Status: A  MDI references (bucket)

Add and update connector references as necessary. This is what is in 1.3:

Suggested Remedy
Use these for now (most will be updated before this project is done):
OSFP Octal Small Form Factor Pluggable Module, Rev 5.0, October 2, 2022
QSFP-DD/QSFP-DD800/QSFP-DD1600 Hardware Specification for QSFP Double Density 8x Pluggable Transceivers, Rev 7.0, September 29, 2023
SFF-8665 Rev 1.9.4, 2022-04-01, QSFP+ 4X Pluggable Transceiver Solutions
SFF-TA-1011 Rev 1.1, 2024-04-19, Cross Reference to Select SFF Connectors and Modules
SFF-TA-1027, Rev 1.0, 2024-04-16, QSFP2 Connector, Cage, & Module Specification
SFF-TA-1031, Rev 1.0, 2023-06-11, SFP2 Cage, Connector, & Module Specification
https://osfpmsa.org/specification.html
http://www.qsfp-dd.com/specification/
Refer to these documents from 179C.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.
800BASE-ER1 is defined as using 800BASE-R encoding, but per 802.3df-2024, 1.4.184 - "The term 800BASE-R represents a family of Physical Layer devices using the Physical Coding Sublayer (PCS) defined in Clause 172 for 800 Gb/s operation." This PHY as noted in Table 169-3a, uses PCS encoding as defined in Clause 186.

Suggested Remedy
Define new name for family / encoding based on Clause 186 encoding.

Response
ACCEPT IN PRINCIPLE.

The comment correctly points out that the definition is not correct. However, it is not necessary to define a new family.

Change the definition of 800BASE-ER1 and 800BASE-ER1-20 to the following:

1.4.184da 800BASE-ER1: IEEE 802.3 Physical Layer specification for 800 Gb/s PHY using 800BASE-ER1 PCS and PMA encoding, dual polarization 16-state quadrature amplitude modulation (DP-16QAM) modulation, and coherent detection with reach up to at least 40 km. (See IEEE Std 802.3, Clause 186 and Clause 187).

1.4.184db 800BASE-ER1-20: IEEE 802.3 Physical Layer specification for 800 Gb/s PHY using 800BASE-ER1 PCS and PMA encoding, dual polarization 16-state quadrature amplitude modulation (DP-16QAM) modulation, and coherent detection with reach up to at least 20 km. (See IEEE Std 802.3, Clause 186 and Clause 187).

Implement with editorial license.

The abbreviation "MLSD" is used numerous times in Annex 178A to reference Maximum Likelihood Sequence Detection and should be added to the abbreviations list.

Suggested Remedy
Add MLSD | Maximum Likelihood Sequence Detection

Response
ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

**Comment Type**: TR
**Comment Status**: A

Add TimeSync entity managed object classes for Inner FEC sublayers defined in Clause 177 and 184.

**Suggested Remedy**

(Presentation will be prepared for this comment.)

**Response**: REJECT.

The following related presentation was reviewed by the 802.3dj task force during the May Interim meeting:
https://www.ieee802.org/3/dj/public/24_05/he_3dj_01_2405.pdf
This presentation does not provide sufficient detail to describe the requested change in Clause 30.

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

There should also be an entry for 800GBASE-ER1 since it is a different PCS

**Suggested Remedy**
Add a new editing instruction to insert 800GBASE-ER1 after 400GBASE-R (or before the entry for 800GBASE-R).

**Response**: ACCEPT.

The register bits and names described on page 8 of the presentation will be used with the exception that the ability bits will be added to example register "TimeSync PMA/PMD capability (Register 1.1800)" and the new delay registers will be added to MMD 1 from location 1.1820 onwards.

Implement the register bits and names described on page 8 of the presentation and with the exception that the ability bits will be added to example register "TimeSync PMA/PMD capability (Register 1.1800)" and the new delay registers will be added to MMD 1 from location 1.1820 onwards.

Implement with editorial licence.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

**Comment Type:** TR  **Comment Status:** R  **timesync (bucket)**
Add MDIO interface registers for Inner FEC sublayers defined in Clause 177 and 184.

**Suggested Remedy:**
Add definitions for the new register set defined for the Inner FEC sublayers in 30.3.1.1 - 30.1.1.14.

(Presentation will be prepared for this comment.)

**Response**  **Response Status:** C  **He, Xiang**  **Huawei**

REJECT.
The following related presentation was reviewed by the 802.3dj task force at the May Interim meeting:
https://www.ieee802.org/3/dj/public/24_05/he_3dj_01_2405.pdf
This presentation concerns TimeSync management and refers to the register set "30.13.1.1 - 30.13.1.14" rather than "30.3.1.1 - 30.1.1.14".
A different comment (#603) addresses adding registers for inner FEC TimeSync. Another comment (#183) concerns adding additional status counters for the inner FEC which will require new registers.
There is insufficient detail given in this comment (#370) and comment #183 to make a change to Clause 45 for inner FEC register definitions at this time.

**Comment Type:** T  **Comment Status:** A  **timesync (bucket)**

Shouldn't LR4 come before LR1 (same reach, narrower) and the order goes up the page, counting the bits forward

**Suggested Remedy:**
Swap 800GBASE-LR4 and 800GBASE-LR1

**Response**  **Response Status:** C  **Dawe, Piers**  **Nvidia**

ACCEPT.

**Comment Type:** T  **Comment Status:** A  **timesync (bucket)**

800BASE-DR4-2 has longer reach than 800BASE-FR4-500

**Suggested Remedy:**
Swap them

**Response**  **Response Status:** C  **Dawe, Piers**  **Nvidia**

ACCEPT.

**Comment Type:** TR  **Comment Status:** A  **timesync (bucket)**

Table 73-5 is missing the indication of higherst priority.

**Suggested Remedy:**
change 1.6Tb/s 8lane in the capability column to 1.6Tb/s 8 lane, highest priority.

**Response**  **Response Status:** C  **Mi, Guangcan**  **Huawei Technologies Co., Ltd**

ACCEPT.

**Comment Type:** TR  **Comment Status:** A  **timesync (bucket)**
It's unfortunate that 800BASE-ER1 and 800BASE-ER1-20 are in different registers, and 800BASE-ER1-20, having less reach, should come first

**Suggested Remedy:**
Move 800BASE-ER1 from 1.73.14 to 1.74.0. 1.73.14 goes back to reserved - maybe it can be used for 800BASE-LR20-1 ;)

**Response**  **Response Status:** C  **Slavick, Jeff**  **Broadcom**

ACCEPT IN PRINCIPLE.
The following presentation was reviewed by the 802.3dj task force at the May Interim meeting.
Implement the changes proposed in slavick_3dj_01_2405 with editorial licence and using appropriate editing instructions.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

---

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

The existing semantics of the link_status parameter of AN_LINK.indication enables only two values, OK and FAIL. This imposes a need to bring up a link within a specified time (link_fail_inhibit_timer), otherwise AN will restart (per the Arbitration state diagram, Figure 73-11). This can cause numerous problems in a segmented link.

The AN should be tolerant to a link in which one or more of the devices is still in the process of training. This can be achieved by adding a third possible value to link_status, indicating that the negotiated PHY is still training.

**Suggested Remedy**
A presentation with proposed content is planned.

**REJECT.**

The IEEE 802.3dj Task Force reviewed the following presentation during the May Interim meeting:
https://www.ieee802.org/3/dj/public/24_05/ran_3dj_05_2405.pdf

The presentation does not provide sufficient detail to implement. A consensus presentation with a complete proposal is encouraged.

---

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

In Table 90A-1, the column titled "Alignment marker/ codeword marker insertion/removal" has a value of 2.56ns for 1.6T in the last row. This value should be the xMII time (at MAC data rate) of one Alignment marker block. The 1.6TE PCS lanes are now running at 100G vs 25G for slower speeds, so this number does not scale directly from the other entries. The value for the 1.6T row should be 1.28ns (a full AM group = 8 256b/257b blocks, so the xMII time = 8 * 256b / 1600 = 1.28ns). Note that this column has correct values for 25G, 40G, 50G, and 100G. However, the value listed for 200G, 400G and 800G of 2.56ns should be 5.12ns and should also be fixed in maintenance.

**Suggested Remedy**
Change 2.56 to 1.28ns in the added row for Table 90A-1

**ACCEPT.**

---

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

In Table 116-3, the last two column, misusage of PMD names.

**Suggested Remedy**
change PHY type of CL 178 and 179 in the table to the correct nomenclature, i.e., 200GBASE-KR1 and 200GBASE-CR1

**ACCEPT IN PRINCIPLE.**
Implement the suggested remedy with editorial license.
In table 116-3a, the last two columns, missusage of PMD names.

**Suggested Remedy**

change PHY type of CL 178 and 179 in the table to the correct nomenclature, i.e., 400GBASE-KR2 and 400GBASE-CR2

**Response**

Response Status C

ACCEPT.

---

200GBASE-R SM PMA delay constraint is missing

**Suggested Remedy**

A suggested remedy is not provided.

With editorial license include the term SM-PMA and BM-PMA, instead of just PMA, where appropriate in this and similar tables.

**Response**

Response Status C

ACCEPT IN PRINCIPLE.

---

In Table 116-9, there should be no applicable SP1 and SP6 for 113.4375GBd PMD lane

**Suggested Remedy**

change the content of row SP1 and SP6 in the column of 113.4375GBd PMD lane to N/A

**Response**

Response Status C

ACCEPT.

---

With the adoption of the objective to do 500m over 4 WDM lanes on a single mode fiber and its nomenclature 800GBASE-FR4-500, "FR" is no longer limited to just represent 2km (e.g. FR-500). This introduces an inconsistency for 200GBASE-FR1 and 200GBASE-DR1 (DR1 is not FR1-500). In addition, when looking at 2km for 1,2,4,8 fibers - a confusing "family" of PHYs emerges (200GBASE-FR1, 400GBASE-DR2-2, 800GBASE-DR4-2, and 1.6TBASE-DR8-2).

**Suggested Remedy**

Rename 200GBASE-FR1 to 200GBASE-DR1-2

**Response**

Response Status C

ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the 802.3dj task force at the May Interim meeting.

https://www.ieee802.org/3/dj/public/24_05/dambrosia_3dj_02a_2405.pdf

Implement the suggested remedy with editorial license.
Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

SORT ORDER: Clause, Subclause, page, line

Comment Status: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  Z/withdrawn

EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

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

Comment Type TR  Comment Status A
Conditional PMA (bucket)

200/400G BASE-R BM-PMA and 200/400G BASE-R-SM-PMA are noted as optional in Tables 116-3, 116-4, and 116-4a, but that is not quite correct. They are conditional dependent on the PHY type and on whether specific AUIs are implemented or not.

SuggestedRemedy
For 100Gb/s based PHYs the 200GBASE-R BM-PMA is mandatory, all AUIs are optional, and 200GBASE-R SM-PMA is “C” / conditional if either 200GAUI-1 is implemented.
For 200Gb/s based PHYs the 200GBASE-R SM-PMA is mandatory, all AUIs are optional, and 200GBASE-R BM-PMA is “C” / conditional if either 200GAUI-2 is implemented.
For 100Gb/s based PHYs the 400GBASE-R BM-PMA is mandatory, all AUIs are optional, and 400GBASE-R SM-PMA is “C” / conditional if either 200GAUI-2 is implemented.
For 200Gb/s based PHYs the 400GBASE-R SM-PMA is mandatory, all AUIs are optional, and 400GBASE-R BM-PMA is “C” / conditional if either 400GAUI-4 is implemented.

Change entries as described above in Tables 116-3, 116-4 and 116-4a for 800GBASE-R BM-PMA and 800GBASE-R-SM-PMA to C / with notes as stated above
Modify entry in Table 178-1 to 200BASE-R BM PMA to Conditional. Add note “c” A 200GBASE-R BM PMA must be implemented if a 200GAUI-2 C2C is implemented. Modify entry in Table 178-2 to 400GBASE-R BM PMA to Conditional. Add note “c” A 400GBASE-R BM PMA must be implemented if a 400GAUI-4 C2C is implemented. Modify entry in Table 179-1 to 200BASE-R SM PMA to Conditional. Add note “c” A 200GBASE-R SM PMA must be implemented if a 200GAUI-1 C2C is implemented. Modify entry in Table 179-2 to 400BASE-R SM PMA to Conditional. Add note “c” A 400GBASE-R SM PMA must be implemented if a 400GAUI-2 C2C is implemented. Modify entry in Table 181-1 to 200BASE-R BM PMA to Conditional. Add note “c” A 200GBASE-R BM PMA must be implemented if a 200GAUI-2 C2C/C2M is implemented. Modify entry in Table 182-1 to 200BASE-R BM PMA to Conditional. Add note “c” A 200GBASE-R BM PMA must be implemented if a 200GAUI-2 C2C/C2M is implemented. Modify entry in Table 182-2 to 400BASE-R BM PMA to Conditional. Add note “c” A 400GBASE-R BM PMA must be implemented if a 400GAUI-4 C2C/C2M is implemented.

Response Response Status C
ACCEPT IN PRINCIPLE. Resolve using the response to comment #312.

---

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

Comment Type TR  Comment Status A
Conditional PMA (bucket)

The comment refers to Table 11603. The SM_PMA and BM_PMA introduce a new case of optional PMA implementation. For instance 200GBASE-KR2 PHY cannot implement SM_PMA without implementing 200GAUI-1 C2C interface.
It will be beneficial to add a note about the conditions which allow require implementation of BM_PMA and SM_PMA
Same apply to Table 11603a, Table 11604, Table 16902

SuggestedRemedy
Add a footnote labeled æbÆ next to the æOÆ marking for 200GBASE-R SM-PMA in the entries for 200GBASE-KR2, 200GBASE-KR4, 400GBASE-CR2, and 400GBASE-CR4. The footnote æbÆ should state: æApplicable only when 200GAUI-1 C2C interface is used within the PHY

Response Response Status C
ACCEPT IN PRINCIPLE. Resolve using the response to comment #312.

---

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

Comment Type TR  Comment Status A
Conditional PMA (bucket)

there is no PMD called 400GBASE-LR4

SuggestedRemedy
Change 400GBASE-LR4 to 400GBASE-LR4-6

Response Response Status C
ACCEPT.
In support of 200 Gb/s per lane signaling - 200GBASE-R BM-PMA and 400GBASE-R PMA, Clause 176 was developed. No addition was made to 116.2 Summary of 200GbE and 400GbE sublayers was made.

Suggested Remedy

Modify last sentence of 116.2.4 and add additional text
The 200GBASE-R and 400GBASE-R PMAs, which supports bit multiplexing, is specified in Clause 120.
The 200GBASE-R and 400GBASE-R PMAs, which supports symbol multiplexing, is specified in Clause 176.
Note that "PMA" is used as a general term to represent both types of PMAs for each speed.

Response

ACCEPT IN PRINCIPLE.
The comment appropriately proposes to add the new PMA types defined in Clause 176 and to differentiate the two based on multiplexing type. It is not necessary to point out that they may both be referred to as PMA and in fact this could be considered incorrect, since any PMA in the 802.3 standard might be called a PMA.
Implement the following with editorial license:
Replace the second sentence in 116.2.4 with appropriate editorial instructions to the following:
200GBASE-R and 400GBASE-R PMAs that use bit multiplexing (BM-PMA) are specified in Clause 120.
200GBASE-R and 400GBASE-R PMAs that use symbol multiplexing (SM-PMA) are specified in Clause 176.
Implement with editorial license.

In support of segment-by-segment training requires passing the RTS status of each device/sublayer in both directions.
When there is a physical interface with a training protocol, RTS is communicated using the protocol. But when two sublayers are attached, e.g. PMD and PMA, the status has to be communicated through the service interface.
This can be achieved if the inter-sublayer service interface includes both IS_SIGNAL.indication and IS_SIGNAL.request.
The values of the parameter SIGNAL_OK should be extended to allow communicating that a sublayer is in the process of training. A new value IN_PROGRESS would enable that.
Similar changes should be applied in clauses 169 and 174. The mapping of RTS to SIGNAL_OK should be defined in annex 176A.

Suggested Remedy

A presentation with proposed content is planned.

Response

ACCEPT IN PRINCIPLE.
The following presentation was reviewed by the 802.3dj task force at the IEEE 802.3 May Interim meeting:
https://www.ieee802.org/3/dj/public/24_05/ran_3dj_05_2405.pdf
Implement the proposal on slides 7 to 10 of ran_3dj_05_2405 with editorial license.
The comment refers to Table 116.8.

There is an additional logical skew present in the 200GBASE-R and 400GBASE-R2 BM_PMA of 2 RS-FEC CWs. These skew values should not be included in the skew budget calculations for this table. To prevent misinterpretations, an explicit note is required.

**Suggested Remedy**

Insert a note in Table 116.8 that states: “The additional 2 RS-FEC CWs logical skew in clause 176 BM_PMA for 200GBASE-R and 400GBASE-R should not to be factored in the skew budget calculations for this table.”

**RESPONSE**

**RESPONSE STATUS:** C

**ACCEPT IN PRINCIPLE.**

Motion #10 at the July 2023 plenary adopted the 4 CW interleaving for the 200GBASE-R 1:8/8:1 and 400GBASE-R 2:16/16:2 PMAs.


The motion explicitly calls out slide 10 of https://www.ieee802.org/3/dj/public/23_07/he_3dj_02a_2307.pdf, which lays out how skew be specified given the resulting systematic and reversible skew.

This consideration is applicable only to PHYs that include the following SM-PMA types:

- 400GBASE-R 16:2 and 2:16
- 200GBASE-R 8:1 and 1:8

Provide appropriate text in 116.5, explaining that for the PHYs summarized above, the skew specified in Table 116-8 excludes the intentional skew used to create the four codeword interleaving.

**IMPLEMENT WITH EDITORIAL LICENSE.**

**Comment Type:** TR

**Comment Status:** A

**Skew (common)**

- **Comment Type:** TR
  - De Koos, Andras
  - Microchip Technology

**Comment Status:** R

I understand why the use of the stateless encoder decoder is restricted to 200GBASE-R, and 400GBASE-R over 200Gbps lanes. Allowing it on other PMDs/AUIs would be out-of-scope for the 802.3dj project.

HOWEVER, shouldn’t common sense prevail, here?

The stateless encoder/decoder was designed such that it is all-but-identical to the stateful encoder, only differing in their treatment of /E/ blocks. Since the 200GBASE-R and 400GBASE-R links are always protected by FEC, it is not as if /E/ blocks can occur at random causing divergent behaviour of the two encoder/decoder types.

There is absolutely no danger of causing backward-compatibility issues, because the stateful encoder/decoder are still allowed for all PMDs.

The stateless encoder/decoder was added to the standard to allow greater implementation flexibility (removing long timing paths). But any new PCS implementation that may attach to either 100Gbps/lane or 200Gbps/lane PMDs would have to implement the stateful encoder/decoder! With the stateless encoder, the standard is offering more implementation flexibility that implementors cannot actually use.

**Suggested Remedy**

Consider removing the restriction on PMD type when using the stateless encoder and decoder in subclauses 119.2.4.1 and 119.2.5.8, respectively.

**RESPONSE**

**RESPONSE STATUS:** C

REJECT.

As stated in the comment itself, adding an option to support stateless encoding/decoding for PHYs that are not part of the 802.3dj project is out-of-scope.

**Comment Status:** R

- **Comment Status:** A

**Extraneous “either”**

**Suggested Remedy**

- remove the word “either”

**RESPONSE**

**RESPONSE STATUS:** C

ACCEPT IN PRINCIPLE.

Implement with editorial license and discretion.

**Response**

**Response Status:** C

**ACCEPT.**
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

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Table 116-1 and Table 116-2 include the 200Gb/s per lane PMDs which require the symbol muxing PMA. This bit muxing PMA would only be used for lower speed AUIs. Saying it supports any of the PMDs in the tables is confusing.

**Suggested Remedy**

Change to "The 200GBASE-R PMA(s) can support any of the 200Gb/s PMDs in Table 116-1 and the 400GBASE-R PMA(s) can support any of the four, or 8 lane 400Gb/s PMDs in Table 116-2." As a less preferred approach PMD's could be changed to PHY's in the original sentence and an additional sentence could be added saying "The single lane 200Gb/s PMDs in Table 116-1 and the two lane 400Gb/s in table 115-2 require the symbol-muxing PMAs described in clause 176."

**Response**

Accept in principle.

Indeed, the PMA defined in Clause 120 can support only PMDs with per-lane signaling rates of 100 Gb/s or less. The referenced paragraph should therefore be corrected.

In Clause 116...

Remove 200GBASE-KR1/CR1 from Table 116-3 and change table title to: "PHY type and clause correlation (200GBASE copper with 2 or 4 lanes)"

Remove 400GBASE-KR2/CR2 from Table 116-3a and change table title to: "PHY type and clause correlation (200GBASE copper with 4 lanes)"

Create new Table 116-3c with title "PHY type and clause correlation (200GBASE copper with 1 lanes)"

Include 200GBASE-KR1/CR1 in this table.

Create new Table 116-3d with title "PHY type and clause correlation (400GBASE copper with 2 lanes)"

Include 400GBASE-KR2/CR2 in this table.

In Clause 120...

Change the referenced sentence to: "The 200GBASE-R PMA(s) can support any of the 200Gb/s PMDs in Table 116-3 and Table 116-4, and the 400GBASE-R PMA(s) can support any of the 400Gb/s PMDs in Table 116-3a and Table 116-5."

Implement with editorial license.

[Editor's note: CC 116, 120]

---

**Cl 120F | SC 120F.1 | P | 522 | L | 7 | # | 57 |
| Dudek, Mike | Marvell |
| **Comment Type** | T |
| **Comment Status** | R |
| Precoding (bucket) |

Clause 176 is for the symbol mux PMA it should not be used for Annex 120F.

**Suggested Remedy**

Remove the reference to 176.9.1.2.

**Response**

REJECT.

Annex 120F is amended to include 1.6TAUI-16.

176.8.4 defines the 1.6TBASE-R 16:16 PMA, which has a 16-lane interface that can use 1.6TAUI-16 as a physical interface.

176.9.1.2 describes the precoding function for all symbol-muxing PMAs, which can also be used in the aforementioned PMA.

---

**Cl 169 | SC 169 | P | 116 | L | 15 | # | 55 |
| Mi, Guangcan | Huawei Technologies Co., Ltd |
| **Comment Type** | TR |
| **Comment Status** | R |
| PHY descriptions (bucket) |

same as the previous comment on 800GBASE-CR4.

**Suggested Remedy**

make the description consistent.

**Response**

REJECT.

The language used here is consistent with other similar PHY types in this table. There is similar differences between the PHYs described in this table and the definitions in 1.4.

---

**Cl 169 | SC 169 | P | 116 | L | 17 | # | 54 |
| Mi, Guangcan | Huawei Technologies Co., Ltd |
| **Comment Type** | TR |
| **Comment Status** | R |
| PHY descriptions (bucket) |

In Table 169-1, Row of 800BASE-CR4 was described as 800Gb/s PHY using 800BASE-R encoding over four lanes of twinaxial copper cable, which is inconsistent with the description in page 49, 1.4.184aa

**Suggested Remedy**

make the language consistent.

**Response**

REJECT.

The language used here is consistent with other similar PHY types in this table. There are similar differences between the PHYs described in this table and the definitions in 1.4.
### Comment Type TR

#### Comment Status A

---

In table 169-3, Phy type and clause correlation was marked incorrectly for the columns of 8000GBASE-DR8 PMD and 800GBASE-DR8-2 PMD.

**Suggested Remedy**

- remove the unnecessary M in the following rows for 800GBASE-DR8 PMD: 800GBASE-DR4, 800GBASE-FR4, and 800GBASE-LR4.

**ACCEPT.**

---

#### Comment Type TR

#### Comment Status R

---

In Table 169-4, the delay constraints on 800GBASE-R BM-PMA and 800GBASE-R SM-PMA are missing.

**Suggested Remedy**

- add appropriate rows with TBD if no consensus has been built.

**REJECT.**

---

#### Comment Type TR

#### Comment Status A

---

In Table 116-6, there should be no applicable SP1 and SP6 for 113.4375GBd PMD lane.

**Suggested Remedy**

- change the content of row SP1 and SP6 for 113.4375GBd PMD lane to N/A

**ACCEPT IN PRINCIPLE.**

---

#### Comment Type TR

#### Comment Status A

---

800GBASE-ER1-20 and 800GBASE-ER1 are both defined as using 800GBASE-R encoding, but per 802.3df-2024, 1.4.184e - "The term 800GBASE-R represents a family of Physical Layer devices using the Physical Coding Sublayer (PCS) defined in Clause 172 for 800 Gb/s operation." These two PHYs as noted in Table 169-3a, they use PCS encoding as defined in Clause 186.

**Suggested Remedy**

- Define new name for family / encoding based on Clause 186 encoding.
- Create new table for PHY type and clause correlation for new family based on Clause 186 encoding.
- Modify description of entry for 800GBASE-ER1-20 in Table 169-1 to reflect new family name.
- Modify description of entry for 800GBASE-ER1 in Table 169-1 to reflect new family name.

**ACCEPT IN PRINCIPLE.**

---

#### Comment Type TR

#### Comment Status A

---

In Table 169-1, change the definitions as follows:

<table>
<thead>
<tr>
<th>Phy Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>800GBASE-ER1-20</td>
<td>800 Gb/s PHY using 800GBASE-ER1 PCS and PMA encoding, dual-polarization 16-state quadrature amplitude modulation (DP-16QAM) modulation, and coherent detection with reach up to at least 20 km (see Clause 187)</td>
</tr>
<tr>
<td>800GBASE-ER1</td>
<td>800 Gb/s PHY using 800GBASE-ER1 PCS and PMA encoding, dual-polarization 16-state quadrature amplitude modulation (DP-16QAM) modulation, and coherent detection with reach up to at least 40 km (see Clause 187)</td>
</tr>
</tbody>
</table>

**Implement with editorial license.**
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Suggested Remedy

Change 800GBASE-R to 800GBASE-ER1 in the last two rows of the table.

Response

ACCEPT IN PRINCIPLE.

Response Status C

6/13/2024  3:31:03 PM

Page 12 of 139
In Table 169-3...
In the cell (800GBASE-DR4 row, 800GBASE-R BM-PMA column), change "O" to "C".
In footnote "a" add ", C = Conditional (refer to PMD clause for details)."
Implement with editorial license.

<table>
<thead>
<tr>
<th>CI</th>
<th>169</th>
<th>SC 169.1.4</th>
<th>P118</th>
<th>L22</th>
<th># 69</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dudek, Mike</td>
<td>Marvell</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comment Type: T  Comment Status: A  (bucket)

There are errors in Table 169-3. 800GBASE-DR8-PMD is not needed for 800GBASE-DR4 or 800GBASE-FR4-500. 800GBASE-DR8-2 PMD is not needed for 800GBASE-DR4-2, 800GBASE-FR4, or 800GBASE-LR4.

Suggested Remedy:
Delete the offending "M"s

Response: C

ACCETP.

<table>
<thead>
<tr>
<th>CI</th>
<th>169</th>
<th>SC 169.1.4</th>
<th>P118</th>
<th>L22</th>
<th># 68</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dudek, Mike</td>
<td>Marvell</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comment Type: T  Comment Status: A  (bucket)

There are errors in Table 169-3. 800GBASE-DR8-PMD is not needed for 800GBASE-DR4 or 800GBASE-FR4-500. 800GBASE-DR8-2 PMD is not needed for 800GBASE-DR4-2, 800GBASE-FR4, or 800GBASE-LR4.

Suggested Remedy:
Delete the offending "M"s

Response: C

ACCETP.

Comment Type: TR  Comment Status: A  Conditional PMA (bucket)

For 800GBASE-LR1 in Table 169-3a
800GBASE-R BM-PMA is conditional, pending implementation of 800GAUI-8 C2C/C2M
800GBASE-R SM PMA is conditional, pending implementation of 800GAUI-4 C2C/C2M

Suggested Remedy:
Change entries for 800GBASE-LR1 to C for 800GBASE-R BM-PMA and 800GBASE-R SM-PMA
Add note "C= Conditional, 800GBASE-R BM-PMA is conditional, pending implementation of 800GAUI-8 C2C/C2M
800GBASE-R SM PMA is conditional, pending implementation of 800GAUI-4 C2C/C2M"

Response: C

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #317.
[Editor's note: Changed subclause from 169.1.3 to 169.1.4]

Comment Type: TR  Comment Status: R  (bucket)

The 800GXS can contain AUIs - so the C2C and C2M clauses should be marked as optional for the ER1 and ER1-20 PHYs, as should the associated PMAs.

Suggested Remedy:
Indicate that 800GBASE-R BM-PMA, 800GAUI-8 C2C, 800GAUI-8 C2M, 800GBASE-R SM-PMA, 800GAUI-4 C2C, and 800GAUI-4 C2M are optional for both ER1 and ER1-20 PHYs.

Response: C

REJECT.

The table references the optional 800GMII Extender which specifies the optional/condition AUIs and PMAs.
In support of 200 Gb/s per lane signaling - 800GBASE-R BM-PMA, Clause 176 was developed. No addition was made to 169.2 Summary of 800 GbE architecture.

**Suggested Remedy**

Modify 169.2.4 to read:

The PMA sublayer provides a medium-independent means to support the use of a range of physical media.

The 800GBASE-R PMA, which supports symbol multiplexing, is specified in Clause 176. Note that "PMA" is used as a general term to represent both types of PMAs.

**Response**

ACCEPT IN PRINCIPLE. The comment appropriately proposes to add the new PMA types defined in Clause 176 and to differentiate the two based on multiplexing type. It is not necessary to point out that they may both be referred to as PMA and in fact this could be considered incorrect, since any PMA in the 802.3 standard might be called a PMA. Implement the following with editorial license:

Replace the second sentence in 169.2.4 with appropriate editorial instructions to the following:

The 800GBASE-R PMA that uses bit multiplexing (BM-PMA) is specified in Clause 173. The 800GBASE-R PMA that uses symbol multiplexing (SM-PMA) is specified in Clause 176. Implement with editorial license.

---

800GBASE-ER1 and 800GBASE-ER1-20 use the Clause 186 800GBASE-ER1 PCS/PMA. This layer is not described as part of 169.2.

**Suggested Remedy**

Create 169.2.4c 800GBASE-ER1 PCS/PMA

The 800GBASE-ER1 PCS performs encoding of data from the 800GMII, performs GMP mapping, applies FEC, and transfers the encoded data to the PMA. The 800GBASE-ER1 PMA sublayer performs the mapping of transmit and receive data streams between the PCS and PMA via the PMA service interface, and the mapping and multiplexing of transmit and receive data streams between the PMA and PMD via the PMD service interface. The 800GBASE-ER1 PCS is specified in Clause xxx.

**Response**

ACCEPT IN PRINCIPLE. Amend subclause 169.2.3 (from 802.3df) to the following with appropriate editorial instructions and mark-ups.

The PCS performs encoding of data from the 800GMII data into a form compatible with the PMA and PMD. The 800GBASE-ER1 PCS is specified in Clause 186. Implement with editorial license.

---

A new 800GBASE-ER1 PCS is defined in clause 186. It should be mentioned in the introduction clause, 169.2.3 ("Physical Coding Sublayer (PCS)") in 802.3df) which currently only refers to the 800GBASE-R PCS.

**Suggested Remedy**

Bring 169.2.3 into the draft and amend it to include the clause 186 PCS.

**Response**

ACCEPT IN PRINCIPLE. Resolve using the response to comment #319.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

**Comment**

There is no inter-sublayer interface for the PMA sublayer shown in the figure

**Suggested Remedy**

Add placeholder text for future text.

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

Figure 169-2b is correct as drawn, except that the PMA definition in the legend should be deleted. However, this same figure is repeated in the 800GBASE-LR1 PMD clause. We should not be repeating figures. Since this form is unique to a single PHY type, not a family, it makes more sense to include the figure in the PMD clause. Delete Figure 169-2b and instead include a reference to Figure 185-2 and Figure 185-3 in 169.3.2. Also, in Figure 184-1 delete the PMA definition from the legend. Implement with editorial license.

---

**Comment**

A similar diagram is needed for 800GBASE-ER1/-20 PHYs.

**Suggested Remedy**

Use figure 169-2b as a basis. Replace 800GBASE-R PCS with 800GBASE-ER1 PCS, 800GBASE-LR1 Inner FEC with 800GBASE-ER1 PMA, and 800GBASE-R PMD with 800GBASE-ER1 PMD (and of course renams all the service interfaces to align with that).

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

A similar diagram for 800GBASE-ER1 and 800GBASE-ER1-20 is provided in Clause 187 which specifies both of these PMD types. No other 800GBASE PMD is of this form so it is not necessary to show a common diagram in Clause 169. However, some clarification for non-800GBASE-R PHY types would be helpful.

In 169.3 add text pointing out that service interfaces used by PMDs not part of 800GBASE-R family are defined and illustrated in the PMD clauses.

Implement with editorial license.

---

**Comment**

The Inner-FEC delay appears to be missing from the table

**Suggested Remedy**

Add 800GBASE-R inner FEC (values are TBDs)

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

---

**Comment**

The title of Clause 173 does include BM.

**Suggested Remedy**

Remove the BM- from Table 171-1 for the Clause 173 entry and footnote A

**Response**

**Response Status** C

REJECT.

The term BM-PMA is used in Table 171-1, because this table includes reference to both BM and SM PMAs, and the convention we agreed on was in such cases to call out both PMAs explicitly. The same convention is used in tables 178-1, 179-1, 180-1, 181-1, 182-1 and 183-1. This is explained in 173.1.1 as follows:

"When necessary for disambiguation, to differentiate the bit-multiplexing PMAs (BM-PMA) types defined in this clause from the symbol-multiplexing PMAs (SM-PMA) types defined in Clause 176, the term BM-PMA is used. Within this clause the term PMAs refers specifically to the BM-PMA.

---

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

Comment Status: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  Z/withdrawn

Sort Order: Clause, Subclause, page, line

Page 15 of 139  6/13/2024  3:31:04 PM
There is an issue with subclause 171.3.3 generated by 802.3df. There is an incorrect reference of "171.6.2" in the following bullets:

- An additional signal TXRD indicates the state of the \textit{rx\_rm\_degraded} variable (see 171.6.2) as detected by the PHY 800GXS in the transmit direction
- An additional signal TXLD indicates the state of the \textit{FEC\_degraded\_SER} variable (see 171.6.2) as detected by the PHY 800GXS in the transmit direction

\textbf{Suggested Remedy}

Import subclause 171.3.3 and correct the two bullets as follows:

- An additional signal TXRD indicates the state of the \textit{rx\_rm\_degraded} variable (see 172.2.6.2.2) as detected by the PHY 800GXS in the transmit direction
- An additional signal TXLD is the logical OR of the \textit{FEC\_degraded\_SER} and \textit{rx\_local\_degraded} variables (see 172.2.6.2.2) as detected by the PHY 800GXS in the transmit direction.

\textbf{Response}

ACCEPT.

---

There is a sentence below the editor's note is a repeat of what is captured in 171.3.2. It is also not released to \textit{link fault signaling} as defined in 81.3.4, which is the topic of this subclause.

\textbf{Suggested Remedy}

Delete the sentence below the editor's note.

\textbf{Response}

ACCEPT IN PRINCIPLE.

---

In tables 171-3 and 171-5, it is not clear what has changed in the rows that are shown.

\textbf{Suggested Remedy}

Indicate the changes with revision marks

\textbf{Response}

REJECT.

Although it may be hard to see, the draft is following 802.3 editing guidelines. The thing that changed in tables 171-3 and 171-5 is that an "_" was added between "FEC\_symbol\_error\_counter" and "<0:31>" in the status variable column. Being added text, the "_" is underlined in keeping with 802.3 editing convention. The missing underscore was missed in the 802.3df draft, including during the final publication review.

\textbf{Response}

REJECT.

This comment was WITHDRAWN by the commenter.
In Table 174-4, the notes for 1.6TBASE-KR8 and 1.6TBASE-CR8 says includes the medium in one direction. No length of the medium was provided, nor any explicit delay due to the medium was provided. While In Table 169-4, a definitive of 14ns allocated for one direction through cable medium was provided for 800GBASE-CR4. One would assume 1.6TBASE-CR8 would be consistent with 800GBASE-CR4. The same problem applies to 1.6TBASE-KR8.

**Suggested Remedy**

Put in explicit allocation of delay constraints for the medium used in 1.6TBASE-CR8 and 1.6TBASE-KR8. Align with that of 800GBASE-CR4 and 800GBASE-KR4, if technically feasible.

**Response**

ACCEPT IN PRINCIPLE.

Use the same text used for 800GBASE-KR8/CR8 in IEEE Std 802.3df-2024.

For the 800GBASE-KR4 row change the text in the note column to: "Includes allocation of 14 ns for one direction through backplane medium. See 178.6."

For 800GBASE-CR4 row change the text in the note column to: "Includes allocation of 14 ns for one direction through backplane medium. See 179.6."

---

This list of interface widths has been traditionally included in "new ethernet rate introduction" clauses since 10 Gb/s Ethernet. It seems unnecessary and present an extra burden to amend with each new interface added. The number of lanes is abundantly clear in each clause that defines and interface. The original intent was to point out that the structural detail of the specified interfaces are to be as specified while others that are not are not specified.

**Suggested Remedy**

Delete the paragraph and lists from page 155 line 47 to page 156 line 12.

**Response**

ACCEPT IN PRINCIPLE.

Retain the first sentence:

"While this specification defines interfaces in terms of bits, octets, and frames, implementations may choose other data-path widths for implementation convenience."

Add a future-proof exception and delete the lettered-list of interfaces. Implement with editorial license.

---

The first subclause of Annex 174 is currently a mini "table of contents" of the clause. This isn't required.

Instead, an introduction to the annex would be helpful for readers. It should provide the relationship between bit error ratio as defined in the project's objective and the frame loss ratio, as well as the purpose of defining error requirements for internal interfaces within the physical layer.

**Suggested Remedy**

A presentation with proposed content is planned.

**Response**

ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the IEEE 802.3dj task force as the May Interim meeting:

https://www.ieee802.org/3/dj/public/24_05/ran_3dj_04a_2405.pdf

Implement the following with editorial license.

Update Annex 174A as proposed on slides 7 to 13 of ran_3dj_04a_2405 excluding option A in slides 11, 12, and 13.

Update clauses/annexes 171, 178, 179, 179D, 179E, 179E, 180 to 183, 185, 187 appropriately.

[Editor's note: CC many]
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

Comment Type: TR  Comment Status: A  BER/FLR

174A.3 "Frame loss ratio for a Physical Layer implementation" is empty.

I assume a "Physical Layer implementation" means the path between the RS and the MDI. It is unclear how frame loss ratio can be defined for this path, because the two interfaces are not equivalent; frames are defined only at the RS, and cannot be identified, checked for errors, or counted on the MDI. Similarly, the signals on the MDI cannot be compared to the data stream on the RS, so no other "error metric" can be defined.

This is in contrast to "RS to RS link" and other subclauses, in which such checking and counting is possible.

This subclause should be deleted.

Suggested Remedy:
Delete 174A.3.

Response:
ACCEPT.

Comment Type: TR  Comment Status: A  BER/FLR

174A.4 "Frame loss ratio for an xMII Extender" is empty.

Since this annex defines several performance metrics, the titles of specific subclauses should be based on the sub-link in question, while the specific requirement (FLR, BER, etc.) should preferably be in the subclause text.

Suggested Remedy:
A presentation with proposed content is planned.

Response:
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #205.

Comment Type: T  Comment Status: R  timesync (bucket1p)

Has any thought been given to how to calculate the latency through the 1.6TBASE-R PCS, i.e. the path data delay values for the purposes of TimeSync?

I do not see anything within the 1.6TBASE-R PCS that would prevent proper calculation of the path data delay values.

Clause 90.7.1 is instructive here, explaining that the path data delays should be "reported as if the DDMP is at the start of the FEC codeword". However, the existing language in 90.7.1 is awkward for PCSs with more than one FEC engine like the 1.6TBASE-R PCS, which has four FEC codewords in parallel.

Suggested Remedy:
No proposed change to Clause 175.
Clause 90.7.1 could be cleaned up to account for when there are multiple FEC codewords in parallel, but I assume that is out-of-scope for the 802.3dj project? I'll submit a maintenance request.

Response:
REJECT.
The suggested remedy does not propose an actionable (within the draft) remedy.

This comment is related to the calculation of the path data delay values in Clause 90, and points out that Subclause 90.7.1 is not clear on how the path data delays values are calculated for PCSs with more than one FEC engine and interleaved FEC codewords. This applies to the 200GbE/400GbE PCS (Clause 119), the 800GbE PCS (Clause 172) as well as the new 1.6TbE PCS being added by this project (Clause 175). As pointed out in the suggested remedy it would be better to address this with a maintenance request that equally applies to all PCS clauses with multiple interleaved FEC codewords and all of their related PHYs (many of which are out of scope for 802.3dj).
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

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

**Comment**: Text says to interleave two codewords from flow 0 and two from flow 1, but it isn't clear that those two should be from different FEC encoders.

**Suggested Remedy**: After FEC encoding, a FEC codeword from each of the two encoders in flow 0 and a FEC codeword from each of the two encoders in flow 1 are then interleaved and distributed to individual PCS lanes.

**Response**  
Implement the suggested remedy with editorial license.

**Comment Status**: A  **Response Status**: C

---

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

**Comment**: A note that modifying the data stream could affect TimeSync would be useful.

**Suggested Remedy**: Add the following note:

> "NOTE -- Insertion or removal of characters may affect protocols like times synchronization (see 90.4.1.2)"

**Response**  
Implement the following with editorial license.

**Comment Status**: R  **Response Status**: C

---

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

**Comment**: The last sentence is giving the transcoded blocks sent to each flow a name. So it's not really make a flow of blocks. If anything it's making a series or stream of blocks.

**Suggested Remedy**: Change the last sentence to read: "The transcoded blocks sent to flow 0 are referred to as tx_xcoded_f0<256:0> and the ones sent to flow 1 as tx_xcoded_f1<256:0>.

**Response**  
Implement the suggested remedy with editorial license.

**Comment Status**: A  **Response Status**: C

---

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

**Comment**: Different scrambler seeds for the two flows are NOT strictly necessary for the 1.6TBASE-R PCS. The output PCSLs are never bit muxed, so having identical outputs from FEC A and FEC C, for example, should never have any adverse effect on "clock content" of the SerDes output. It doesn't hurt to have the scramblers be seeded differently, however.

**Suggested Remedy**: Consider changing the last sentence on page 173 from:

> "This creates two flows of transcoded blocks, tx_xcoded_f0<256:0> to flow 0, and tx_xcoded_f1<256:0> to flow 1."

To:

> "This creates two streams of transcoded blocks, tx_xcoded_f0<256:0> to flow 0, and tx_xcoded_f1<256:0> to flow 1."

**Response**  
Resolve using the response to comment #454.

**Comment Status**: A  **Response Status**: C

---

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

**Comment**: It is not helpful to sprinkle notes related to time synchronization throughout the various sublayer clauses; this was not done in previous clauses/projects. Rather it would be preferable to add the necessary text into Clause 90/Annex 90A. A consensus presentation with a complete proposal is encouraged.

**Response**  
RESOLVE.

**Comment Status**: A  **Response Status**: C

---

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

**Comment**: Add the following note:

> "NOTE -- Insertion or removal of characters may affect protocols like times synchronization (see 90.4.1.2)"

**Response**  
RESOLVE.

**Comment Status**: A  **Response Status**: C
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
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</thead>
<tbody>
<tr>
<td>175</td>
<td>175.2.4.5</td>
<td>P174</td>
<td>L3</td>
<td>354</td>
</tr>
<tr>
<td>Opsasnick, Eugene</td>
<td>Broadcom</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment Type**: T  **Comment Status**: A  **Scrambler seeds (bucket)**

The Editor's note at the end of subclause 175.2.4.5 "Scrambler" states that there are no requirements or restrictions in the 1.6TE PCS baselines for the scrambler seeds for each flow. The note also mentions that the corresponding sub-clause in 802.3df for 800GE PCS states that the two flows would have identical outputs if the seeds are identical and the data input is identical (such as after reset). The 1.6TE PCS does not have two separate sets of PCSLs like 800GE PCS, but the PCSL formation could have back-to-back repeating RS-symbol values if identical seeds are used. Suggest to require different seeds after reset in the scramblers of each flow as written in the paragraph above the editor's note.

**Suggested Remedy**

Remove the editor's note at the top of page 174, and leave the wording in 175.2.4.5 as-is with the requirement that the two scramblers are initialized with different seeds.

**Response**  
**Response Status**: C  
**Accept in Principle**.

Comment #331 notes that the 1.6T PCS lanes are never bit-muxed so different seeds may not be necessary. While the effect of identical scrambler seeds is worse with bit-muxing than symbol-muxing, there may still be some detrimental effects with symbol muxing. If there are identical seeds and identical data, then the FEC-A and FEC-B codewords would be identical to the FEC-C and FEC-D codewords, respectively. With symbol muxing, the resulting data on a output lane would be symbols [A, B, C, D] where A=C and B=D. In general, it is safer to require different seeds to avoid any potential side-affect. As the comment #331 points out, it doesn't hurt to have the scramblers seeded differently.

Delete the editor's note near top of page 174.

<table>
<thead>
<tr>
<th>Cl</th>
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<th>L</th>
<th>#</th>
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<tr>
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<td>Slavick, Jeff</td>
<td>Broadcom</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Comment Type**: T  **Comment Status**: R  **tx_am_sf doesn't allow but provides a way to communicate the mandatory degrade status.**

**Suggested Remedy**

Change "allows the local PCS to communicate the status of the FEC degraded feature to the remote PCS" to "communicates the local PCS FEC degraded status to the remote PCS".

**Response**  
**Response Status**: C  
**Reject**.

The draft is correct as written, and the proposed change does not improve clarity.

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
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<th>L</th>
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<td>Opsasnick, Eugene</td>
<td>Broadcom</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Comment Type**: T  **Comment Status**: A  **Scrambler seeds (bucket)**

Sub-clause 172.2.4.6 has a reference to a text file containing the 800GBASE-R alignment marker values. CL 175 should add a similar note with a corresponding text file for the 1.6TBASE-R alignment markers.

**Suggested Remedy**

Add text near line 22: "NOTE: A text file containing the alignment marker patterns, as shown in Table 17501 is available at https://standards.ieee.org/downloads/802.3/.

A presentation will be submitted with a corresponding text file containing the 1.6TBASE-R AM values.

**Response**  
**Response Status**: C  
**Accept in Principle**.


Implement with editorial license.

---

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

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

**SORT ORDER**: Clause, Subclause, page, line
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

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

am_mapped_f0 and am_mapped_f1 aren't solely based on the 10b-distribution and we never talk about how this two variables are us splitting the alignment marker group up.

**Suggested Remedy**

Change:

1. The variables am_mapped_f0 and am_mapped_f1 are then derived from 10-bit interleaving the group of 16 alignment markers, am_x, using the following procedure:
2. The alignment marker group is mapped into variables am_mapped_f0 and am_mapped_f1 as follows. First a 10-bit interleaving the group of 16 alignment markers, am_x, is done using the following procedure:

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

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

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

am_mapped_f0 and am_mapped_f1 contain data that is sent into flow 0/1 and through codewords AB and CD.

**Suggested Remedy**

Change:

1. Note that am_mapped_f0 contains the 10-bit symbols of FEC codewords A and B, and am_mapped_f1 contains the 10-bit symbols of FEC codewords C and D.
2. Note that am_mapped_f0 is sent to flow 0 which produces FEC codewords A and B, and am_mapped_f1 is sent to flow 1 which produces FEC codewords C and D.

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

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

**Comment Type: T**  **Comment Status: A**  **FEC error counters**

The counters for corrected, uncorrected and error have always been mandatory, while the cw counter and bin counters have been optional. So Should is not appropriate.

**Suggested Remedy**

Change:

1. The following counters should be implemented to aid a network operator in determining the link quality.
2. The PCS provides the following counters that track FEC decoder statistics.

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

ACCEPT IN PRINCIPLE.
There is a list of 5 FEC counters in 175.2.5.3.

- The first three are definitely required (as they were also required in CL 91, 108, 119, 134, and 172) which makes the "should" wording incorrect.
- (FEC_corrected cw_counter, FEC_uncorrected cw_counter, and FEC_symbol_error counter_i)

- The 4th and 5th counters (FEC cw_counter and FEC codeword_error_bin_i) are explicitly "optional" in 161.6.21, 172.3.5 and 172.3.6.

- The importance of these counters is well recognized in the industry so should be mandatory for the 1.6TBASE-R PCS

Make all 5 counters required for the 1.6TBASE-R PCS.
Implement with editorial license.

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

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

**SORT ORDER:** Clause, Subclause, page, line  **Cl 175**  **SC 175.2.4.6**  **P 176**  **L 5**  **# R65**

Slavick, Jeff  Broadcast

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

Add a intro to what tx_scrambled is.

**Suggested Remedy**

Change:

1. "The variables tx_scrambled_am_f0<10279:0> and tx_scrambled_am_f1<10279:0> are constructed in one of two ways."
2. "In each flow a 10280-bit block of data is formed with two FEC codewords worth of message data, tx_scrambled_am_f0<10279:0> in flow 0 and tx_scrambled_am_f1<10279:0> in flow 1 and they are constructed in one of two ways."

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

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

**Comment Type:** T  **Comment Status:** A  **FEC error counters**

The counters for correctd, uncorrected and error have always been mandatory, while the cw counter and bin counters have been optional. So Should is not appropriate.

**Suggested Remedy**

Change:

1. "The following counters should be implemented to aid a network operator in determining the link quality."
2. "The PCS provides the following counters that track FEC decoder statistics."

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

ACCEPT IN PRINCIPLE.
There is a list of 5 FEC counters in 175.2.5.3.

- The first three are definitely required (as they were also required in CL 91, 108, 119, 134, and 172) which makes the "should" wording incorrect.
- (FEC_corrected cw_counter, FEC_uncorrected cw_counter, and FEC_symbol_error counter_i)

- The 4th and 5th counters (FEC cw_counter and FEC codeword_error_bin_i) are explicitly "optional" in 161.6.21, 172.3.5 and 172.3.6.

- The importance of these counters is well recognized in the industry so should be mandatory for the 1.6TBASE-R PCS

Make all 5 counters required for the 1.6TBASE-R PCS.
Implement with editorial license.

**Cl 175**  **SC 175.2.4.6.2**  **P 177**  **L 6**  **# R67**

Slavick, Jeff  Broadcast

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

Add a intro to what tx_scrambled is.

**Suggested Remedy**

Change:

1. "The variables tx_scrambled_am_f0<10279:0> and tx_scrambled_am_f1<10279:0> are constructed in one of two ways."
2. "In each flow a 10280-bit block of data is formed with two FEC codewords worth of message data, tx_scrambled_am_f0<10279:0> in flow 0 and tx_scrambled_am_f1<10279:0> in flow 1 and they are constructed in one of two ways."

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

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

**Comment Type:** T  **Comment Status:** A  **FEC error counters**

The counters for correctd, uncorrected and error have always been mandatory, while the cw counter and bin counters have been optional. So Should is not appropriate.

**Suggested Remedy**

Change:

1. "The following counters should be implemented to aid a network operator in determining the link quality."
2. "The PCS provides the following counters that track FEC decoder statistics."

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

ACCEPT IN PRINCIPLE.
There is a list of 5 FEC counters in 175.2.5.3.

- The first three are definitely required (as they were also required in CL 91, 108, 119, 134, and 172) which makes the "should" wording incorrect.
- (FEC_corrected cw_counter, FEC_uncorrected cw_counter, and FEC_symbol_error counter_i)

- The 4th and 5th counters (FEC cw_counter and FEC codeword_error_bin_i) are explicitly "optional" in 161.6.21, 172.3.5 and 172.3.6.

- The importance of these counters is well recognized in the industry so should be mandatory for the 1.6TBASE-R PCS

Make all 5 counters required for the 1.6TBASE-R PCS.
Implement with editorial license.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

Comment Type: T  Comment Status: A

The Note about tracking statistics across all 4 decoders is missing from the bin counter.

Suggested Remedy:
Add this to the definition of the FEC_codeword_error_bin_i
"Note that this counter tracks codewords with errors across all four codewords."

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

Comment Status: A

Response Status: C

Slavick, Jeff
Broadcom

Comment Type: T  Comment Status: A

Annex 175A contains tabular data for an example created by the 1.6TBASE-R PCS TX functions, including the scrambler output, RS-FEC codeword generation, and PCS lane interleaving. The editor's note on page 539 has a placeholder for a link to a text file that has the machine readable text data. That data file needs to be created.

Suggested Remedy:
A presentation is planned to submit a data file which corresponds to the Annex 176A example and can be referenced in the editor's note

Response
ACCEPT IN PRINCIPLE.
Update the editor's note with link to the text file
(https://www.ieee802.org/3/dj/public/24_05/opsasnick_3dj_03_2405.txt) as presented in
Implement with editorial license.

Comment Status: R

Response Status: C

de Koos, Andras
Microchip Technology

Comment Type: T  Comment Status: R
timesync (bucket1p)
Has any thought been put into how to calculate the path data delay values (MII-MDI latencies for timestamping) for the SM-PMAs? For bit-mux PMAs, it is very simple - i.e. it is all implementation delay, since the intrinsic delay from bit muxing/demultiplexing is negligible. But at first glance, determining the latency across the Clause 176 PMA looks like more of a challenge.
a. I don't believe that the intrinsic (i.e. non-implementation) delay is deterministic, due to the partial deskew.
b. But apart from the partial deskew, the latency across the SM-PMA should be deterministic using the principles in Annex 90A.7 (max latency value used for Tx path data delay, min latency value used for Rx path data delay).
c. Traditionally, how to calculate the delays through the PHY layers has been an implementation concern, but this is because the calculation was straightforward at lower rates. At 200Gbps lanes, the standard does not have the luxury of being able to ignore this. If it is overly complicated or ambiguous, and opposite ends of a link do not implement it in the same fashion, the system Time Synchronization will be impaired.

Suggested Remedy:
Consider a note in Clause 176 (or next to the PMA path data delay MDIO registers - 45.2.1.176, 45.2.1.177) that the path data delay values for the SM-PMA should be calculated via the method in Annex 90A.7. I don't think it is necessary, but if a more detailed explanation is deemed useful, then a subclause could be added to Clause 90.7 spelling out explicitly how the path data delay values should be calculated for the SM-PMA.

Response
ACCEPT IN PRINCIPLE.
Update the Editor's note with link to the text file
(https://www.ieee802.org/3/dj/public/24_05/opsasnick_3dj_03_2405.txt) as presented in
Implement with editorial license.

Comment Status: R

Response Status: C

Timesync (bucket1p)
Comment Type: Precoding

In this section, precoding is mentioned to CR, KR and C2C links. How about C2M link? It should add C2M since C2M LT session specifies precoding as one of the options.

Suggested Remedy:
Add C2M link into the statement: “The precoding specifications in this subclause apply to the input and output lanes of a PMA that are connected to the service interface of an xBASE-CRN or xBASE-KRn PMD, or are part of an xAUI-n C2C/C2M link.”

Response Status: C

Accept in principle.

Background and proposed changes are provided on slides 4 to 10 in the following presentation:

Implement the proposed text on slide 4 of brown_3dj_02_2406.
Implement with editorial license.

Comment Type: Editorial

Is respectively necessary here? X is just a list of different rates.

Suggested Remedy:
remove the“, respectively.”

Response Status: C

Accept in principle.

Delay Odd PCSLs (bucket)

The comment refers to Figure 176-2.
The functions of “Delay odd PCSLs by 2 RS-FEC codewords” on Tx path and “Delay even PCSLs by 2 RS-FEC codewords” can be misleading, as they could be interpreted as a delay by 10,880 symbols.
The intention is to delay the odd (Tx) and even (Rx) PCSLs by 136 symbols in order to get multiplex and demultiplex symbols from different 2 RS-FEC CWs.

Same apply to Figure 176-9

Suggested Remedy:
Modify the description in the Tx path box from “Delay odd PCSLs by 2 RS-FEC codewords” to “Delay odd PCSLs by 136 symbols” and in the Rx path box from “Delay even PCSLs by 2 RS-FEC codewords” to “Delay even PCSLs by 136 symbols”

Response Status: C

Reject.
The function in Fig 176-2 uses the words “2 RS-FEC codewords” as opposed to “136 RS-FEC symbols” because the function aims to align the 2 codewords on even lanes with 2 different codewords on odd lanes by delaying odd lanes by 2 codewords. This enables symbol multiplexing across 4 codewords. Same applies to Fig 176-9, 176-11 and 176-13.
While it is not inaccurate to call it a “136 symbol delay”, an advantage of using “2 RS-FEC codewords” as opposed to “136 symbols” is that the function name is equally applicable to both 200GE and 400GE SM-PMAs. Moreover, the first line of subclause 176.5.1.3.4 clearly specifies the delay as being 136 RS-FEC symbols, and the subsequent line shows this mathematically as “2 codewords × 544 symbols per codeword / 8 PCS lanes = 136 symbols.” Similarly, subclause 176.6.1.2.4 (400GE 16:2 PMA) specifies the delay to be 68 symbols.

Hence, the delay value is clearly specified and there is no room for misinterpretation.
The comment proposes an alternate description which is technically correct but does not improve the accuracy or readability of the standard.
20b deskew is incorrect. According to Motion #10 in https://www.ieee802.org/3/dj/public/23_07/motions_3cdjdfd_2307.pdf, it is required to deskew to codeword boundaries.

SuggestedRemedy
Change "20b deskew" to "deskew to codeword boundaries" or simply "deskew"

ACCEPT IN PRINCIPLE.
Resolve using the response to comment # 368

In the AM lock and deskew clauses, is a full deskew not necessary? The goal of the Clause 176 PMA, if I understand correctly, is that at the output lane(s), each set of 4 consecutive 10-bit symbols must come from 4 different RS-FEC codewords. In the current draft, this is not achieved.

Without skew, everything works because the symbol delay is in the same direction as the FEC CW delay. But with n*20b of skew, where some odd PCSLs arrive before even PCSLs, after the 10bit delay on odd PCSLs, (Clause 176.5.1.3.4) and the 2 CW delay (Clause 176.5.1.3.4), there will still be a period of overlap where symbols from the same FEC codeword appear at the same time. Symbols from the same RS_FEC CW can thus appear within 2 symbols after the output mux.

Before skew (showing boundary between FEC words 1 and 2):
- PCSL0: B2 A2 B1 A1 B1 A1
- PCSL1: A2 B2 A1 B1 A1 B1

20-bit skew: PCSL1 arrives before PCSL0 (when PCSL0 is finishing A1/B1, PCSL1 has already started A2/B2)
- PCSL0: B2 A2 B1 A1 B1 A1
- PCSL1: A2 B2 A1 B1 A1 B1

10-bit delay on odd lane (Clause 176.5.1.3.4):
- PCSL0: B2 A2 B1 A1 B1 A1
- PCSL1: A2 B2 A1 B1 A1 B1

2 FEC CW delay on odd lane (Clause 176.5.1.3.4):
- PCSL0: B2 A2 B1 A1 B1 A1
- PCSL1: A1 B1 A0 B0 A0 B0

-> B1s line up on PCSL 0 and 1 for one 8:1 two-symbol mux cycle.

with more than 20 bits of skew, there will be more "codeword overlap".

Adding a "full deskew" may not be too costly.
Or, is this potential overlap due to skew understood and planned for in the AUI/PMD loss budgets?

SuggestedRemedy
Consider requiring a full deskew instead of the 20/40 bit deskew in clauses (176.5.1.3.1, 176.6.1.2.1, 176.7.1.2.1, 176.8.1.2.1).

ACCEPT IN PRINCIPLE.
therefore no changes to the deskew function are required.

For 200GBASE-R and 400GBASE-R resolve using the response to comment #368.

Comment Type: T  Comment Status: A  Deskew (logic)
Skew in series within the PHY sub-layers may not have deterministic sum, making accurate path data delay calculation impossible. See Annex 90A.6 for a more detailed explanation. Towards the MDI, the transmit SM-PMA function should thus have the option to undo any skew introduced by the Tx PCS layer and AUI links. (i.e. do a full de-skew).
In the Rx direction, the same problem exists. If the SM-PMA does not do a full deskew, then the remaining skew, in series with skew from other layers in the PHY (from AUIs, for example) and from the medium, will have a non-deterministic sum.
Adding an option for the SM-PMA to do a full deskew (not just a 20/40-bit deskew) would be a way to allow implementations to avoid the TimeSync impairment due to skew between the PHY layers.
This is a lot to digest - I can present the reasoning here if leadership thinks it would be worthwhile.

Suggested Remedy
Consider requiring (or allowing as an option) a full deskew instead of the 20/40 bit deskew in clauses (176.5.1.3.1, 176.6.1.2.1, 176.7.1.2.1, 176.8.1.2.1).

Response  Response Status: C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #368.

Comment Type: T  Comment Status: A  Deskew (logic)
There is reference in the text to lock process in Figure 119-12. However, there are exceptions to Figure 119-12 as outlined in 176.5.1.6.
It can be beneficial to refer to 176.5.1.6 which include both the reference to Figure 119-12 and the list of exceptions list

Suggested Remedy
Add a reference to 176.5.1.6 instead of Figure 119-12

Response  Response Status: C
ACCEPT IN PRINCIPLE.
Add note in parenthesis "(see 176.5.1.6.4)" after Fig 119-12.
Implement with editorial license.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

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**Comment**

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

**Slavick, Jeff**  
**Broadcom**

There is more details to the AM lock function add a reference

**Suggested Remedy:**

add a "(see 175.5.1.6.4)" after Table 119-1

**Response**

**Response Status:** C  
**Response:**  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #534.  

[Editor's note: Changed clause, subclause from 175, 175.5.1.3.1 to 176, 176.5.1.3.1]

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**Comment**

**Comment Type:** TR  **Comment Status:** A

**He, Xiang**  
**Huawei**

20b deskew is incorrect. According to Motion #10 in https://www.ieee802.org/3/dj/public/23_07/motions_3cwdfdj_2307.pdf, it is required to deskew to codeword boundaries.

**Suggested Remedy:**

Remove the second and third paragraph in 176.5.1.3.1 and reuse 119.2.5.1.

**Response**

**Response Status:** C  
**Response:**  
ACCEPT IN PRINCIPLE.  

The presentation https://www.ieee802.org/3/dj/public/24_06/shrikhande_3dj_01a_2406.pdf was reviewed by the CRG.

Implement Option 3 as described in slide 11 of shrikhande_3dj_01a_2406 and add a statement that full deskew to alignment markers is a valid 4-codeword boundary.

Implement with editorial license.

---

**Comment**

**Comment Type:** T  **Comment Status:** R

**de Koos, Andras**  
**Microchip Technology**

The SM-PMA adds a lot of latency due to the 2x RS-FEC CW delay in the 8:1 and 16:2 SM-PMAs, as compared to the bit-mux PMAs. For setups with an MII-Extender it is actually worse, since the penalty would also exist between the DTE_XS and PHY_XS. If latency is a concern, it actually becomes preferable to use 100Gbps links for the DTE_XS <-> PHY_XS AUI interface, negating the advantages of 200Gbps links!  
The latency penalty for the 8:1 and 16:2 PMAs should be noted in Clauses 176.5.1.3.4 and 176.6.1.2.4.

**Suggested Remedy:**

Add the following note to the 2xFEC CW delay sub-clauses (176.5.1.3.4 and 176.6.1.2.4):  
Note that the delay added to the odd PCSLs (and to the even PCSLs at the far-end) causes an end-to-end latency increase of 51.4ns as compared to BM-PMAs.

**Response**

**Response Status:** C  
**Response:**  
REJECT.  
The standard is not expected to note pros and cons of one PMA versus another (in this case the latency of SM-PMA versus a BM-PMA).  
The comment proposes a change that does not improve the clarity or accuracy of the draft.

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IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 176  SC 176.5.1.3.4  P202  L51  #  537
Rechtman, Zvi  Nvidia

Comment Type  TR  Comment Status  R  DelayOddPCSLs (bucket)
The sentence “This is equivalent to adding a delay of 2 RS-FEC codewords to the odd PCS lanes (2 codewords × 544 symbols per codeword / 8 PCS lanes = 136 symbols).” can be misinterpreted:
136 symbol delay × 4 odd PCS lanes = 544 symbols delay in total (not 2 RS-FEC codewords delay)

Suggested Remedy
Remove “This is equivalent to adding a delay of 2 RS-FEC codewords to the odd PCS lanes (2 codewords × 544 symbols per codeword / 8 PCS lanes = 136 symbols).”
Modify: “Adding the two codeword delay to odd numbered lanes enables the multiplexing of four consecutive RSFEC symbols from four different codewords at the output of the 8:1 symbol multiplexer.”
To: “Adding the 136 symbol delay to odd numbered lanes enables the multiplexing of four consecutive RSFEC symbols from four different codewords at the output of the 8:1 symbol multiplexer.”

Response  Response Status  C  REJECT.
The first line of subclause 176.5.1.3.4 clearly specifies that the odd lanes are delayed by 136 RS-FEC symbols, and the subsequent line describes mathematically that this (136 symbol delay) is equivalent to adding a delay of 2 codewords to the odd lanes by showing that “2 codewords × 544 symbols per codeword / 8 PCS lanes = 136 symbols”. There is little room left for misinterpretation, since the delay in symbols is stated upfront.

Cl 176  SC 176.5.1.3.4  P203  L45  #  536
Rechtman, Zvi  Nvidia

Comment Type  T  Comment Status  A  Figures (bucket)
The comment refers to Figure 176-5:
The diagram represents a specific skew case between PCS lanes. For instance in the absence of skew between the PCS lanes in the PMA:IS_UNITDATA_0:7.request primitive, the first symbol of A’ of the odd PCS lane should be marked as A’ because of the additional one symbol delay prior to the 136 symbols delay

Suggested Remedy
Option 1:
Modify only the first A’ symbol of the odd PCS lanes to be A’.
Option 2:
Split the drawing into two: one for 200GBASE-R and another for 400GBASE-R. Then, add index numbers to the A, B and A’, B’ symbols.
This could make it easier to understand the drawings and the roles of the symbols in each context.

Response  Response Status  C  ACCEPT IN PRINCIPLE.
Resolve using the response to comment # 293

Cl 176  SC 176.5.1.3.5  P203  L25  #  576
Slavick, Jeff  Broadcom

Comment Type  E  Comment Status  A  (editorial)
It's a multiplexor or a multiplexing function

Suggested Remedy
add the word function after multiplexing

Response  Response Status  C  ACCEPT IN PRINCIPLE.
Implement with editorial license and discretion.
In Figure 176-6, the output lane arrow is indicated in the opposite direction than the actual transmission order of the output PCSL symbols.

**Suggested Remedy**
Change the direction of the arrow to follow the actual transmission order.

**Response**
ACCEPT IN PRINCIPLE.
Update Fig 176-6 to clarify the order of transmission on the output lane, with editorial license.

---

Is there anything preventing an implementation from performing a full deskew at the Rx PMA? It is not technically required, but does not cause any adverse functional effects. A full deskew at the Rx SM-PMA would NOT change end-to-end latency, since the skew is all ultimately undone at the Rx PCS. A deskew upstream would simply offload the deskew from the Rx PCS. Implementations with a SM-PMA attached to an RxPCS will undoubtedly perform the Alignment marker lock only once (not once in the PMA and again in the PCS). AM-lock plus deskew is a very natural coupling of functions.

**Suggested Remedy**
Consider adding the following note to the Rx Alignment marker lock clauses (176.5.1.4.2, 176.6.1.3.2, 176.7.1.3.2, 176.8.1.3.2):
After the Alignment Marker lock, no deskew of the PCSLs is required. However, deskewing the PCSLs before the would not have and adverse functional effects.

**Response**
REJECT.
An implementation of the PMA Rx could deskew the PCS lanes during alignment lock (as the comment suggests). However this is an implemention choice, and should not be called out in the standard.

---

The Variables state that these all of them, not inheriting Cl 119 functions except for some replacements.

**Suggested Remedy**
Copy Figure 119-12 into Cl 176 and modify it to use:
restart_lock_dir **with dir in italics **
amps_lock_dir ** with dir in italics **
pcs_lane_mapping_dir ** with dir in italics **
add a NOTE that italics dir is either mux or demux

In Variables, Constants and Counters sections define everything that is used, referring to Cl 119 when possible.

Change references to Figure 119-12 to point to the new figure.

With editorial license

**Response**
ACCEPT IN PRINCIPLE.
Resolve using the response to comment # 80.
Slavick, Jeff  Broadcom

**Comment Type:** T  **Comment Status:** A  **Reorg**

To support 400G also using the same state machines we need to make Figure 176-8 and the definition of `symbol_pair_lock_demux` have a `<y>` in it.

**Suggested Remedy:**
Add a `<y>` to `symbol_pair_lock_demux` definition and in Figure 176-8. Update the definition in 176.5.1.6.1 for `symbol_pair_lock_demux=y` to have a range of of `y=0`

**Response:**

- **Response Status:** C
- **Accept in Principle.**
- Resolve using the response to comment # 80.

Slavick, Jeff  Broadcom

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

Figure 119-12 uses functions and variables defined in CL119 but those aren't called out to be used, just that `restart_lock_mux` is used to replace `restart_lock`

**Suggested Remedy:**
Add "using the state variables defined in 119.2.6.2" after Table 119-1 with editorial license

**Response**

- **Response Status:** C
- **Accept in Principle.**
- Implement the suggested remedy with editorial license.

Slavick, Jeff  Broadcom

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

Figure 119-12 uses functions and variables defined in CL119 but those aren't called out to be used, just that `restart_lock_mux` is used to replace `restart_lock`

**Suggested Remedy:**
Add "using the state variables defined in 119.2.6.2" after Table 119-1 with editorial license

**Response**

- **Response Status:** C
- **Accept in Principle.**
- Implement the suggested remedy with editorial license.

Oett, David  Juniper Networks

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

Should there be an arc from ALIGNMENT_FAIL to LOSS_OF_ALIGNMENT?

**Suggested Remedy:**
If so, add the arc

**Response**

- **Response Status:** C
- **Reject.**
- In the ALIGNMENT_FAIL state, `restart_lock_mux` is set to true which results in AM lock process of Fig 119-12 to be restarted on all lanes. This results in `all_locked_mux` to be set to false, which causes the state machine of 176-7 to go from ALIGNMENT_FAIL to LOSS_OF_ALIGNMENT state.
The comment refers to Figure 176.8&PMA receive symbol-pair lock state diagram. The state diagram is defined as single state machine per the entire PMA. However, each PMA lane may have a different reference skew, leading to varying SLIP operation requirements per PMA lane (e.g., one PMA lane doesn't require SLIP because all PCS lanes of that lane are locked, but other PMA lane still need to skew to find the 20 symbol bit boundaries) therefore the state diagram should be defined per PMA lane and not for per PMA.

**Suggested Remedy**

Modify the state diagram per PMA lane and not per PMA, this include change in the variables to be defined per <y>:

- restart_lock_demux<y>
- symbol_pair_lock_demux<y>
- start_symbol_pair_lock_counter_demux<y>
- symbol_pair_lock_demux<y>

**Response**

Accept in principle. Resolve using the response to comment # 80.

---

The comment refers to Clause 176.5 and 176.6. They are 95% similar, so repeating everything is hardly necessary.

**Suggested Remedy**

Consider merging subclauses 176.5 and 176.6

**Response**

Accept in principle. Implement with editorial license and discretion.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

The 800G 32:4 PMA, 400G 16:2 PMA and the 200G 8:1 PMA are basically the same, other than the numbers of lanes. The 1.6T 16:8 is different since it has 40b deskew and 4-symbol interleaving. All of the PMAs with the same number of lanes on both sides are essentially the same. It would simplify maintenance and likely reader understanding as well if the number of lanes were parameterized as m and n.

Suggested Remedy:
Reorganize 176.5 through 176.8 into 3 clauses: one for 200/400/800 m:n PMAs, one for 1.6T m:n PMAs, and one for 200/400/800/1.6T m:m PMAs, and use a single set of text and figures with the parameters m and n for the number of lanes. Include a table showing PHY rates and the values of m and n (e.g. with columns PHY, m, and n, and rows 200GBASE-R, 8, 1; 400GBASE-R, 16, 2; etc.).

Response
ACCEPT IN PRINCIPLE.
Reorganize the Clause to reduce repetition of text and figures, and make the state diagrams more generic across the SM-PMAs.
Implement with editorial license.

Comment Type TR
The comment refers to Figure 176-11.
The functions of "Delay odd PCSLs by 2 RS-FEC codewords" on Tx path and "Delay even PCSLs by 2 RS-FEC codewords" can be misleading, as they could be interpreted as a delay by 10.880 symbols. The intention is to delay the odd (Tx) and even (Rx) PCSLs by 68 symbols in order to get multiplex and demultiplex symbols from different 2 RS-FEC CWs.
Same apply to Figure 176-13

Suggested Remedy
Modify the description in the Tx path box from "Delay odd PCSLs by 2 RS-FEC codewords" to "Delay odd PCSLs by 68 symbols" and in the Rx path box from "Delay even PCSLs by 2 RS-FEC codewords" to "Delay even PCSLs by 68 symbols"

Response
REJECT.
Resolve using the response to comment #533.

Comment Type E
Table 176-7 includes two references to 400GBASE-R, these should be replaced with 800GBASE-R.

Suggested Remedy
Replace the text "400GBASE-R" with "800GBASE-R" in Table 176-7.

Response
ACCEPT IN PRINCIPLE.
Implement with editorial license and discretion.
In Figure 176-16 and Figure 176-17, on the following page, the symbol pattern of the even PCSLs in the upper half (PCSLs 16-31) is not shown. It would be easier to see the RS symbol patterns if the figures included at least one even PCSL in the range of 16-31.

**Suggested Remedy**

These two figures show PCSLs for lanes 0,1, and 31. Suggest to show the PCSL symbol pattern for lanes 0,1, 16, 17, 31.

**Response**

Accept in principle.

Implement the suggested remedy with editorial license.

---

In all Figures in the 800G PMA section, it is referred to AÆ/BÆ symbols, although we have 4 RS CWs.

**Suggested Remedy**

Change to use A, B, C, D for the 4 RS CWs, instead of A, B, AÆ, BÆ

**Response**

Accept in principle.

Resolve using the response to comment # 593

---

In Figure 176-18, the output lane arrow is indicated in the opposite direction than the actual transmission order of the output PCSL symbols.

**Suggested Remedy**

Change the direction of the arrow to follow the actual transmission order.

**Response**

Accept in principle.

Update Figure 176-18 to clarify the order of transmission on the output lane, with editorial license.

---

Test pattern check is overlapping with IS_SIGNAL.request

**Suggested Remedy**

Move "test pattern check" to no overlap with PMA.IS_SIGNAL.request in Figure 176-21

**Response**

Accept in principle.

Implement with editorial license and discretion.
The text currently refers to xAUI-n C2C. However, the adopted PMA baseline proposal stated that the δPrecoding capability in all physically instantiated interfaces is æTx:required, Rx:optionalÆ (per ran_3dj_01a_2303 slide 10). This specification should also encompass xAUI-n C2M.

Suggested Remedy
Add xAUI-n C2M

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #21

The paragraph refers only to the case of PMD control function operation, need to refer to Annex 176A for all electrical interfaces

Suggested Remedy
Replace:
"If the PMA is connected to the service interface of an xBASE-CRn or xBASE-KRn PMD and training is enabled by the management variable mr_training_enable (see 136.7), then recorder_tx_out_enable_i and precoder_rx_in_enable_i shall be set as determined by the PMD control function in the LINK_READY state on lane i (see 136.8.11.7.5 and Figure 136û7). The method by which the MD control function affects these variables is implementation dependent."

With:
"If the PMA support the Control function and start-up protocol for electrical interfaces and training is enabled by the management variable mr_training_enable (see Annex 176A), then precoder_tx_out_enable_i and precoder_rx_in_enable_i shall be set as determined by the control function in the LINK_READY state on lane i (see 176A.10.4 and Figure 176Aû6). The method by which the PMA control function affects these variables is implementation dependent."

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #21
Comment Type: T  Comment Status: A
The annex title includes “Control function and start-up protocol”, while in the subclauses and text there are alternative terms such as “interface control function”, “Start-up protocol”, and “training” (176A.9).

This mega-function requires nomenclature to describe it. It would be good to have an acronym-friendly name so that it can be included in tables of other clauses (e.g., Table 116-3, Table 179-1).

Suggested Remedy: A presentation with proposed nomenclature is planned.

Response: Response Status: C
ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the 802.3dj task force at the May Interim meeting:

May Interim Straw poll # has the following results:
Straw Poll #4
The nomenclature that I prefer for function defined in Annex 176A is:
A. “Inter-sublayer link training” (ILT or ISLT)
B. “Sublink training” (SLT)
Results (all): A: 81, B: 5


Update the draft such that references to the link training function (AKA control function) use the following name and acronym instead:
"inter-sublayer link training"
"ILT".
Implement with editorial license.

[Editor’s note: The comment type was change from ER to T as it was deemed somewhat technical.]
The use of the terms 'segment' and 'link' in Annexe 176A, for example in 176A.1 where it says, 'in single-segment or multiple-segment links', are problematic.

IEEE Std 802.3 subclause 1.4.505 'segment' defines it as 'The medium connection, including connectors, between Medium Dependent Interfaces (MDIs) in a CSMA/CD local area network.' Subclause 1.4.372 'link' defines it as 'The transmission path between any two interfaces of generic cabling. (From ISO/IEC 11801.)'.

As a result, I believe it would only be correct to call an electrical channel between two PMD sublayers a 'segment'. I do not believe that the electrical channel between any other combinations of sublayers is a 'segment'.

Suggested Remedy
I would suggest 'section' as an alternate to 'segment', but that was used for 'The portion of the link between the PSE Power Interface (PI) and the PD PI.' (see 1.4.378) when PoE had a similar definition problem. Alternatives, therefore, might be 'Division' and 'Sector'.

As another approach, the following is a rewording of 176A.1 to avoid the use of the terms 'segment' and 'link' without the use of a new term. I acknowledge, however, that such an approach would require a significant rewrite of the Annex.

The start-up protocol facilitates timing recovery and equalization of the electrical channel between adjacent sublayers, or chains of multiple adjacent sublayers while providing a mechanism through which the receiver can configure the transmitter to optimize performance. The protocol supports these functions through the continuous exchange of fixed-length training frames across the electrical channel between adjacent sublayers and the transport of end-to-end indications across chains of multiple adjacent sublayers.

Accept in Principle.

The following contribution was reviewed by the 802.3dj Task Force during the May 2024 Interim meeting https://www.ieee802.org/3/dj/public/24_05/law_3dj_01_2405.pdf

Implement the following with editorial license.

In Annex 176A (and other clauses where appropriate), replace "segment" with "section" and "link" with "path".

---

"tx_symbol and rx_symbol variables" do not appear in this annex. They are in fact parameters of the service interface primitives of the sublayer that implements the control function.

Suggested Remedy
Tie the text defining the symbols to the service interface of the sublayer.

Accept in Principle.

Implement with editorial license and discretion.

The first 'shall' statement in Annex 176A (normative) 'Control function and start-up protocol for electrical interfaces' is in 176A.2.3.1 'PRBS13 function'. It seems, however, that there should be 'shall' statements in relation to the entire Training frame structure.

Suggested Remedy
[1] In subclause 176A.2.1, change 'The training frame marker is a run ...' to read 'The training frame marker shall be a run ...'.
[2] In subclause 176A.2.2, change 'The control field comprises ...' to read 'The control field shall be comprised of ...'.
[3] In subclause 176A.2.2, change 'The status field comprises ...' to read 'The status field shall be comprised of ...'.
[4] In subclause 176A.2.3, change 'The training pattern is the result of a ...' to read 'The training pattern shall be the result of a ...'.

Accept in Principle.

Implement suggested remedy with editorial license.
Comment Type: T  Comment Status: R  ILT Frame (bucket)

Subclause 176A.2.2 'Control and status fields' says that 'The control field comprises 16 bits with the structure defined in 176A.3.', yet figure 176Aû1 'Training frame structure' above shows the control field comprising of 16 cells. It, therefore, appears that the field is comprised of 16 cells that convey 16 bits.

Suggested Remedy

[1] Change the first paragraph of 176A.2.2 to read 'The control field is comprised of 16 cells which convey 16 bits with the structure defined in 176A.3. The status is comprised of 16 cells which convey 16 bits with the structure defined in 176A.4.

[2] Change the last sentence of the penultimate paragraph of 176A.2.2 to read 'Within each field, the order of transmission is from bit 15 to bit 0, conveyed by cell 15 to cell 0 respectively.'.

Response  Response Status: C  REJECT.

The cell concept is described in detail in the following paragraph (second paragraph of 176A.2.2). Note that the text is identical to the text in 136.8.1.1.2.

Text is correct as written, proposed remedy does not improve the clarity of the draft.

Comment Type: T  Comment Status: R  ILT Frame (common)

Subclause 176A.2.2 says '... if a violation of the DME encoding rules is detected within the control field or the status field, the contents of both fields in that frame are ignored.' If this is requirement, suggest it should be stated using a 'shall' statement.

Suggested Remedy

Change '... the contents of both fields in that frame are ignored.' to read '... the contents of both fields in that frame shall be ignored.'.

Response  Response Status: C  REJECT.

Note that this text is identical to the text in 136.8.11.1.2.

Text is correct as written, proposed remedy does not improve the clarity of the draft.

Comment Type: TR  Comment Status: A

The default identifier for each lane is its lane number (e.g., the default value for identifier_0 is 0 which selects polynomial_0)

Some interfaces have 8 lanes.

The default mapping provided in Table 176Aû1 can be used instead.

Suggested Remedy

Change to "The default identifier for each lane is the same as that of the PRBS13 function, as shown in Table 176A-1."

Response  Response Status: C  ACCEPT IN PRINCIPLE.

Implement the following with editorial license.

Change: "The default identifier for each lane is its lane number"
To: "The default identifier for each lane is the same as that shown in Table 176A-1"

Comment Type: T  Comment Status: A  ILT Pattern (Bucket)

The PRBS gen should "stop" if training stops.

Suggested Remedy

Add "while training is in progress and this mode is selected" after "is not stopped or reset".

Response  Response Status: C  ACCEPT IN PRINCIPLE.

Implement the following with editorial license.

Add "while training is in progress and this mode is selected" after "is not stopped or reset".

Comment Type: T  Comment Status: A  ILT Pattern (common)

There is only 1 mode of operation for PRBS13 free-running, PAM4. We do have 1 free mode.

Suggested Remedy

Add PRBS13-free running with precode as an option for a training pattern.

Response  Response Status: C  ACCEPT IN PRINCIPLE.

Resolve using the response to comment #358
In the case of multi-lane operation, if all lanes exit the QUIET state simultaneously and use the same PRBS31 initial seed, there will be an undesired crosstalk effect. This potential issue needs to be addressed.

**Suggested Remedy**

Explicitly define that each lane must use different initial seed.

**Response**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #358.

Comment Type TR

Comment Status A

ILT Pattern (common)

Rechtman, Zvi

Nvidia

These three variations are produced as described for the PRBS13 free-running function in 176A.2.3.2.

PRBS13 free-running is defined only with PAM4 and does not have PAM2 or PAM4+precoding variants. These variants are defined for the PRBS13 function in 176A.2.3.1, but the definition of the precoding variant includes resetting of the precoder state at the beginning of each training frame, which would be inadequate.

**Suggested Remedy**

Change to the following:

The initial state of the PRBS31 generator shall not be all zeros. It may be any other value.

When the training pattern selector is set to PAM4, the training pattern is generated in a similar manner to the definition in 176A.2.3.2, except that PRBS31 generator output is used instead of PRBS13 generator output.

When the training pattern selector is set to PAM2, the training pattern is generated in a similar manner to the definition in 176A.2.3.2, except that PRBS31 generator output is used instead of PRBS13 generator output, and the pair of bits \([A, A]\) is used instead of \([A, B]\).

When the training pattern selector is set to PAM4 with precoding, the training pattern is generated from the PRBS31 PAM4 pattern by precoding the Gray-mapped PAM4 symbols as specified in 135.5.7.2. The precoder initial state is not specified. The state is not re-initialized or reset during generation of the training pattern.

**Response**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #358.

Comment Type TR

Comment Status A

ILT Pattern (common)

Ran, Adee

Cisco

PRBS13 free-running can only provide PAM4 it does not have a select for PAM2 or PAM4 with precode while PRBS31 does have those options. So how can we refer to PRBS13 free running for how to map the PRBS data to training pattern.

**Suggested Remedy**

Split the 2nd paragraph of 176A.2.3.3 into 3 paragraphs that defines how the pattern for each of the possible encoding options as is done in 176A.2.3.1.

**Response**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #358.

Comment Type T

Comment Status A

ILT Pattern (common)

Slavick, Jeff

Broadcom

The PRBS gen should "stop" if training stops.

**Suggested Remedy**

Add "while training is in progress while this mode is selected" after "is not stopped or reset".

**Response**

ACCEPT IN PRINCIPLE.

Implement the following with editorial license.

Add "while training is in progress and this mode is selected" after "is not stopped or reset".

Comment Type T

Comment Status A

ILT Pattern (common)

Slavick, Jeff

Broadcom

There is no zero pad for PRBS31 free-running. This means we could have a run length of 31 3's in a row when the maximal run length of the PRBS pattern runs into Frame Marker. The zero pad is really part of the Framer Marker ensuring there is a distinct edge ahead of 16 UI run 3's for the start of the frame marker.

**Suggested Remedy**

Bring the zero-pad back into the definition of the training frame. Stating that it is immediately precedes the training frame marker to provide a distinct transition from training pattern to frame marker of the next training frame.

**Response**

REJECT.

Resolve using the response to comment #358.
Comment Type T   Comment Status A   ILT Frame (common)
Training pattern options have been added to give receiver additional flexibility to
successfully complete training. However, that flexibility is limited by a menu of fixed
combinations of encoding and test pattern options. It would be better if encoding and test
pattern selections were separated to allow receivers to request whatever combination best
suits their needs. There is space in the control and status field structures to accommodate this.

Suggested Remedy
In Table 176A-2, restore bits in control field bits 8 and 9 to the original "Modulation and
precoding request" encoding defined in Clause 162. Define bits 5 and 6 to be "Test pattern
request" with 00=PRBS13, 01=Free-running PRBS13, 10=Reserved, and 11=Free-running
PRBS31. Restore bits 10 and 11 in the status field (Table 176A-3) to the "Modulation and
precoding status" encoding defined in Clause 162. Define bits 12 and 13 to be "Test pattern
status" using the same encodings as the control field. Update Figure 176A-2, 176A.3.2,
and 176A.10.3.1 accordingly. Also add subclauses corresponding to the Modulation and
precoding request/status fields.

Response Response Status C
ACCEPT IN PRINCIPLE.

The CRG reviewed the editorial team's notes on slides 15-32 of

The following straw poll was taken:
Straw poll TF-1 (direction)
I support the following direction for resolution of the training-pattern related comments in
brown_3dj_02b_2406
A. Option 1, as shown on slides 19-29
B. Option 2, as shown on slides 30-32
C. Need more information
D. Abstain
A: 13 B: 5 C: 4 D: 16

In discussion there was no consensus for adding the pad symbols as shown on slide 26.

Implement option 1 as shown on slides 20-27, with the exception that pad symbols are not
added when the free-running PRBS13 or PRBS31 pattern generators are used.

Implement with editorial license.

Response Response Status C
ACCEPT IN PRINCIPLE.

The CRG reviewed the editorial team's notes on slides 15-32 of

The following straw poll was taken:
Straw poll TF-1 (direction)
I support the following direction for resolution of the training-pattern related comments in
brown_3dj_02b_2406
A. Option 1, as shown on slides 19-29
B. Option 2, as shown on slides 30-32
C. Need more information
D. Abstain
A: 13 B: 5 C: 4 D: 16

In discussion there was no consensus for adding the pad symbols as shown on slide 26.

Implement option 1 as shown on slides 20-27, with the exception that pad symbols are not
added when the free-running PRBS13 or PRBS31 pattern generators are used.

Implement with editorial license.

Response Response Status C
ACCEPT IN PRINCIPLE.

The CRG reviewed the editorial team's notes on slides 15-32 of

The following straw poll was taken:
Straw poll TF-1 (direction)
I support the following direction for resolution of the training-pattern related comments in
brown_3dj_02b_2406
A. Option 1, as shown on slides 19-29
B. Option 2, as shown on slides 30-32
C. Need more information
D. Abstain
A: 13 B: 5 C: 4 D: 16

In discussion there was no consensus for adding the pad symbols as shown on slide 26.

Implement option 1 as shown on slides 20-27, with the exception that pad symbols are not
added when the free-running PRBS13 or PRBS31 pattern generators are used.

Implement with editorial license.

Note that comment #196 proposes to change "multi-segment control function" to
"inter-sublayer link training". If necessary, adjust the text to reflect the new terminology.
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Comment Type: T  Comment Status: A  ILT Frame (common)

It would be better to have the existing patterns the same as for previous clause 136.

Suggested Remedy
In Table 176A-3 use the 1 in bit 12 for the new patterns keeping the bits 11 and 10 the same as they were in clause 136 i.e. change 010 to PAM4 PRBS13, 100 to PAM4 free running PRBS13, 011 to PAM4 PRB13 with precoding and 110 to PAM4 free-running PRBS31

Response: Response Status: C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #358.

Comment Type: T  Comment Status: A  ILT Frame (Bucket)

You have self generated data you're sending but you don't have your self setup to send mission data yet.

Suggested Remedy
Remove the "No data is available," from the option 1 of Extend training bit

Response: Response Status: C
ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Comment Type: T  Comment Status: A  ILT Frame (Bucket)

176A.4.3 'Receiver frame lock' says that 'When the receiver frame lock bit is set to 1, the receiver is indicating that it has identified training frame marker positions and is in a state where the response time requirements specified in 176A.10 are met.' It then goes on to say 'Receiver frame lock ... is not set to 1 until training and local_tf_lock are both true.'

176A.10 is 'Variables, functions, timers, counters, and state diagrams', so I wonder if the reference should be to 176A.8 'Handshake timing'? In addition, I don't believe the variables training and local_tf_lock are conditioned on the response time requirements specified in 176A.10 being met, at least I didn't see it in their descriptions.

Suggested Remedy
In 176A.4.3 change the text '... response time requirements specified in 176A.10 are met.' to read '... response time requirements specified in 176A.8 are met.' and the text '... and is not set to 1 until training and local_tf_lock are both true.' To read '... and is not set to 1 until training and local_tf_lock are both true and the response time requirements specified in 176A.10 can be met.'

Response: Response Status: C
ACCEPT IN PRINCIPLE.
Implement the following with editorial license.
Change: "... response time requirements specified in 176A.10 are met."
To: "... response time requirements specified in 176A.8 are met."
Change: "... and is not set to 1 until training and local_tf_lock are both true."
To: "... and is not set to 1 until training and local_tf_lock are both true and the response time requirements specified in 176A.8 can be met."
Comment Type T  Comment Status A  ILT Frame (Bucket)  

176A.4.8 'Coefficient status' says that 'The acknowledge reflects the value of coef_sts resulting from the procedure described in 176A.6.3.' I don't see a procedure that sets coef_sts in 176A.6.3; but there is one in 176A.6.4. With that said, is it correct that it is just this procedure that sets coef_sts? On review of Figure 176Aû9 'Coefficient update state diagram', I see it directly sets coef_sts to 'not_upd' in the OUT_OF_SYNC state and indirectly sets coef_sts using the procedure described in 176A.6.4 through calls to the UPDATE_C(k) function in the NEW_REQUEST state. This seems to be confirmed by the first paragraph of 176A.6.4 which says 'The handling of incoming requests is specified by the coefficient update state diagram (Figure 176Aû9). The behavior of the UPDATE_C(k) function shall be consistent with the following algorithm.'.

Suggested Remedy

Change 'The acknowledge reflects the value of coef_sts resulting from the procedure described in 176A.6.3.' to read 'The coefficient status bits reflect the value of coef_sts variable generated by the coefficient update state diagram (Figure 176Aû9).'.

Response  Response Status C

ACCEPT.

---

Comment Type T  Comment Status A  ILT Frame (Bucket)  

176A.4.8 'Coefficient status' says 'The acknowledge reflects the value of coef_sts resulting from the procedure described in 176A.6.3.' to read 'The coefficient status bits reflect the value of coef_sts variable generated by the coefficient update state diagram (Figure 176Aû9).'.

Response  Response Status C

ACCEPT.

---

Comment Type E  Comment Status A  (editorial)  

Should the status field name be uniquified? The field name in the text of the table and text sections below the table do not clearly identify text as a field.

Suggested Remedy

Change Receiver ready to RECEIVER_READY or at maybe receiver_ready and use the same in the text below the table 176A-3- Status field structure. Pertains to all field names.

Response  Response Status C

ACCEPT IN PRINCIPLE.

Implement with editorial license and discretion.

---

Comment Type TR  Comment Status A  ILT Coefficients (Bucket)  

"When the interface control state diagram (Figure 176Aû6) is in the TRAIN_LOCAL state, the device may request its link partner to..."

It is important to also note at which states requests from the link partner should be processed, and what happens in the other states - this may not be obvious.

Suggested Remedy

Insert the following paragraphs after the first one:

When the interface control state diagram is in either the TRAIN_LOCAL or TRAIN_REMOTE state, the device shall respond to requests received from the link partner.

When the interface control state diagram is in any state other than TRAIN_LOCAL or TRAIN_REMOTE, the device shall not send any requests to the link partner and shall ignore requests from the link partner.

Response  Response Status C

ACCEPT.

---

Comment Type T  Comment Status A  ILT Frame (Bucket)  

Since calls of the UPDATE_C(k) function and direct updates of the coef_sts variable all occur in the Coefficient update state diagram, suggest that 'The acknowledge reflects the value of coef_sts resulting from the procedure described in 176A.6.3.' in 176A.4.8 should be changed to just read 'The acknowledge reflects the value of coef_sts generated by the Coefficient update state diagram'.

Response  Response Status C

ACCEPT IN PRINCIPLE.

This comment appears to address the same concern expressed in comment #564. Resolve using the response to comment #564.
To support AUI or PMDs only providing a subset of the available PRESETs we should define a behavior in that scenario.

Suggested Remedy:
Add a statement that if the AUI or PMD does not specify coefficient values for a given preset setting then no change is made to the existing settings and ic_sts response of updated is provided.

Response
ACCEPT IN PRINCIPLE.

This entire block of pseudo-code in this subclause is exactly the same as the code in subclause 136.8.11.4.4, and the entire subclause only differs by adding one coefficient (-3) to the k_list. I suggest replacing the text of the entire subclause with a reference to subclause 136.8.11.4.4.

Suggested Remedy:
New text for this subclause:
"The handling of incoming requests is specified by the coefficient update state diagram (Figure 136-9).

The behavior of the UPDATE_C(k) function shall be consistent with the algorithm specified in 136.8.11.4.4 with one exception:
- The set of valid equalizer coefficient indices, k_list, is expanded by one from {-2, -1, 0, 1} to {-3, -2, -1, 0, 1}.

Response
ACCEPT IN PRINCIPLE.

Annex 176A is intended to be the specification for link training for 200 Gb/s per lane PMDs/AUIs and potentially higher signaling rate PMDs/AUIs.

Since it is substantially different from the earlier PMD control function, this annex is written as a complete specification. Although referencing an older subclause in some subclauses is an option, it would be beneficial for readers of the standard to have a complete specification in this annex.

Add informative notes where content is identical to content in a particular subclause in Clause 136 with editorial license.
Law, David

Comment Type: E  Comment Status: A  (editorial)

176A.6.4 says that 'The variables coef_req, coef_sts, and k are defined in 176A.10.3.1.', however, 176A.10.3.1 'Variables' uses all lowercase for the coef_sts values (e.g., updated, coefficient at limit and equalization limit) and coef_req (e.g., decrement, increment) whereas 176A.10.3.1 uses all uppercase for the coef_sts values (e.g., UPDATED, COEFFICIENT AT LIMIT AND EQUALIZATION LIMIT) and coef_req (e.g., DECREMENT, INCREMENT).

Suggested Remedy
The formatting of the variable values defined in 176A.10.3.1 'Variables' and used in 176A.6.4 should match.

Response  Response Status: C
ACCEPT IN PRINCIPAL.
Implement with editorial license and discretion.

Law, David

Comment Type: E  Comment Status: A

176A.6.4 says that 'The variables coef_req, coef_sts, and k are defined in 176A.10.3.1.', however, 176A.10.3.1 'Variables' uses all lowercase for the coef_sts values (e.g., updated, coefficient at limit and equalization limit) and coef_req (e.g., decrement, increment) whereas 176A.10.3.1 uses all uppercase for the coef_sts values (e.g., UPDATED, COEFFICIENT AT LIMIT AND EQUALIZATION LIMIT) and coef_req (e.g., DECREMENT, INCREMENT).

Suggested Remedy
The formatting of the variable values defined in 176A.10.3.1 'Variables' and used in 176A.6.4 should match.

Response  Response Status: C
ACCEPT IN PRINCIPAL.
Implement with editorial license and discretion.

Simms, William

Comment Type: E  Comment Status: A  (editorial)

It took me longer than usual to realize the algorithm continues on page 559

Suggested Remedy
Maybe put a '-continued--' at the last line of page 558. Disregard if this is inconsistent with IEEE style

Response  Response Status: C
ACCEPT IN PRINCIPAL.
Implement with editorial license and discretion.

Ran, Adee

Comment Type: TR  Comment Status: A  ILT Coefficients (Bucket)

"When the receiver frame lock bit in the status field of transmitted training frames is set to 1, the time from the receipt of a new request to the acknowledgment of that request shall be less than 2 ms"

This requirement was defined in 802.3cd when training was limited in time (to 3 seconds) in order to prevent limiting the number of change requests due to delayed responses.

The new training scheme is not limited in time, and a receiver can use as many requests as it needs.

In some multi-tasking implementations, a hard 2 ms maximum may be challenging to meet. To avoid real-time requirements, it would be sufficient to have 2 ms as the average response time (and it does not need to be normative). The maximum response time can be relaxed without impact to the protocol.

Suggested Remedy
Change to
"When the receiver frame lock bit in the status field of transmitted training frames is set to 1, the time from the receipt of a new request to the acknowledgment of that request shall be less than 20 ms. It is recommended that the average response time is less than 2 ms".

Response  Response Status: C
ACCEPT.
Figure 176A.5 'Retimer reference model' shows the data multiplexor driven by the tx_mode value, with the multiplexor select set to 0 when tx_mode = training and set to 1 when tx_mode = data. Subclause 176A.10.2.1 'Variables', however, defines three values for tx_mode, training, local_pattern and data. Figure 176A.5, therefore, does not define the multiplexor select value for when tx_mode = local_pattern.

**Suggested Remedy**

Update the figure to reflect the third value of tx_mode and the local pattern generator for each interface.

**Response**  

ACCEPT IN PRINCIPLE.  
Implement the following with editorial license.  
Add the local_pattern option to the data selector.  
Add a Local pattern box as an input to the data selector.

The arrow pointing to the Interface A 'Driver' block and arrow pointing from the Interface B 'CDR' block both seem to be pointing in the wrong direction.

**Suggested Remedy**

Reverse the direction of both arrows.

**Response**

ACCEPT.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Comment Type  T  Comment Status  A  ILT Diagrams (Bucket)

The last sentence of the tx_disable variable description says that the ‘... output on the lane is disabled.’. Is this correct, the first sentence says that tx_disable ‘... controls the transmitter's output on the interface.’ and tx_disable is defined under subclause 176A.10.2 ‘Per-interface variables, functions and timers’. Suggest that the reference to ‘lane’ is changed to ‘interface’, or use ‘all lanes of the interface’ in the variable description to reflect the segment_ready variable description immediately above.

Suggested Remedy
á Either
á [a] Change the text ‘... output on the lane is disabled.’ in the last sentence of the tx_disable variable description to read ‘... output on the interface is disabled.’.
á or
á [b] Change [1] the text ‘... the transmitter's output on the interface.’ in the first sentence of both the tx_disable and tx_mode variable descriptions to read ‘... the transmitter output on all lanes of the interface.’; and [2] the text ‘... output on the lane is disabled.’ in the last sentence of the tx_disable variable description to read ‘... output on all lanes of the interface is disabled.’.

Response  C

Implement the following with editorial license.

- Add the following sentence at the end of the tx_disable definition:
  "When it is false, tx_mode controls the content of the transmitter's output on the lane."

- Move the definition of tx_mode to 176A.10.3.1 and change the definition of tx_mode from: "Enumerated variable that controls the content of the transmitter's output of the interface." to: "Enumerated variable that controls the content of the transmitter's output of the lane when tx_disable is false."
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Comment Type: T
Comment Status: A

176A.10.3 'Per-lane variables, functions, timers and counters' says 'The device implements one instance of each of the interface control state diagrams, and the set of associated ... for each of the n physical lanes on each of its interfaces (see 176A.9)'. I don't think this is correct as I believe that the interface control state diagram is one for each interface of a device (see 176A.10.2), and it is the frame lock and coefficient update state diagrams that are one for each lane of each interface of a device.

Suggested Remedy
Change "The device implements one instance of each of the interface control state diagrams ..." to read 'The device implements one instance of each of the frame lock and coefficient update state diagrams ...'.

Response: Accept in principle.

The Interface control state diagram in Figure 176A-6 is implemented per lane, only the RTS update state diagram in Figure 176A-7 is implemented per interface.

It would be helpful to separate the state diagrams into the per-interface and per-lane subclauses.

Implement the following with editorial license.
Change the first sentence of 176A.10.2, from: "A device implements one instance of each of the interface control state diagrams independently for each of its interfaces (see 176A.9)." to: "A device implements one instance of the RTS update state diagram".

Break subclause 176A.10.4 (State diagrams) into two subclauses, one in 176A.10.2 (Per-interface variables, functions and timers) and one in 176A.10.3 (Per-lane variables, functions, timers and counters).

Change the title of Figure 176A-6 from "Interface control state diagram" to Figure 176A-6 from "Training control state diagram".

Comment Type: T
Comment Status: A

The variables local_tf_lock, remote_tf_lock, local_rx_ready and remote_rx_ready are all defined in 176A.10.3 'Per-lane variables, functions, timers and counters' and are related to a lane, yet they are used by figure 176A-6 'Interface control state diagram'. 176A.10.2 'Per-interface variables, functions and timers' says 'A device implements one instance of each of the interface control state diagrams independently for each of its interfaces (see 176A.9)'.

Suggested Remedy
Perhaps figure 176A-6 'Interface control state diagram' should use a 'interface' version of each of these variables that are a logical AND of the respective lane variable in the case of a multi-lane interface.

Response: Accept in principle.

Resolve using the responses to comments #566, #567 and #571.

Comment Type: T
Comment Status: A

The description of the local_tf_lock variable in 176A.10.3.1 says that 'The value of this variable is encoded as the "training lock" bit in the status field of transmitted training frames.', however, there isn't a "training lock" bit defined for the training frames. Since 176A.4.3 'Receiver frame lock' says 'Receiver frame lock ... is not set to 1 until training and local_tf_lock are both true' it seems that local_tf_lock is encoded in the 'Receiver frame lock' bit.

Suggested Remedy
Change the text '... is encoded as the "training lock" bit ...' in the local_tf_lock variable description to read '... is encoded in the "Receiver frame lock" bit ...'.

Response: Accept.

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

Comment Status: D/dispatched  A/accepted  R/rejected  Response Status: O/open  W/written  C/closed  Z/withdrawn

Sort Order: Clause, Subclause, page, line
### Comment #569

**Comment Type:** Suggested Remedy

**Comment Status:** A

**Description:**

`176A.10.3.3 'Timers' is a subclause of 176A.10.3 'Per-lane variables, functions, timers and counters', yet the three times listed, quiet_timer, propagation_timer and recovery_timer are all used by the interface control state diagram. 176A.10.2 'Per-interface variables, functions and timers' says 'A device implements one instance of each of the interface control state diagrams, and the set of associated variables, functions, counters and timers defined in this subclause, independently for each of its interfaces (see 176A.9). As a result, it seems these timers should be moved to 176A.10.2.3 'Timers' and the descriptions should be updated to reflect that they operate on a per-interface basis.

**Suggested Remedy:**

1. Move the quiet_timer, propagation_timer and recovery_timer definitions to 176A.10.2.3 'Timers' and delete 176A.10.3.3 'Timers'.
2. Change the text '... the interface control state diagram on a lane enters the ...' in the description of quiet_timer, propagation_timer and recovery_timer to read '... the interface control state diagram on an interface enters the ...'.

**Response:**

Accept in principle. Resolve using the response to comment #571.

### Comment #458

**Comment Type:** Suggested Remedy

**Comment Status:** A

**Description:**

The state diagram shown in Figure 176A-8 "Training frame lock state diagram" on page 570 and Figure 176A-9 "Coefficient update state diagram" are exactly the same as the state diagrams of the same names in Figure 136-8 and Figure 136-9. Only the reset signal is renamed from "mr_restart_training" to "mr_restart".

**Suggested Remedy:**

Remove Figure 176A-8 and Figure 176A-9.

Change "mr_restart" to "mr_restart_training" in subclause 176A.10.2.1 on page 564, line 21.

Change the text at the bottom of page 566 to refer to the equivalent state diagrams in clause 136 instead of the removed figures (with editorial license).

Any variables defined in subclause 176A.10.3.1 which are only used in the removed state diagrams can also be removed.

**Response:**

Accept in principle. Resolve using the response to comment #457

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**Comment Status:** A

**Response Status:** C

**Response:** Accept in principle. Resolve using the response to comment #571.
The operation of precoding after the completion of the start-up protocol is missing.

Suggested Remedy

Add the following text:

"If the LINK_READY state is entered with local_tp_mode set to "PAM4 with precoding", then the PMA shall transmit all subsequent data on the corresponding lane with precoding (see 176.9.1.2).

If the LINK_READY state is entered with remote_tp_mode set to "PAM4 with precoding", then the PMA shall subsequently received data on the corresponding lane includes precoding (see 176.9.1.2)."

Response

ACCEPT IN PRINCIPLE.

Implement the following with editorial license.

After the first paragraph of 176A.10, add the following text:

If the LINK_READY state in the Interface control state diagram (see Figure 176A-6) is entered with local_tp_mode set to "PAM4 with precoding", then the PMD or AUI shall cause the adjacent PMA to transmit all subsequent data on the corresponding lane with precoding (see 176.9.1.2).

If the LINK_READY state is entered with remote_tp_mode set to "PAM4 with precoding", then the PMD or AUI shall inform the adjacent PMA that all subsequently received data on the corresponding lane includes precoding (see 176.9.1.2).

Comment Type: TR  Comment Status: A  ILT Diagrams (Bucket)

There should be an underscore between the timer name and 'done'.

Suggested Remedy

Suggest that 'recovery_timer done' should be changed to read 'recovery_timer_done'.

Response

ACCEPT.
The comment refers to Figure 176A-6Interface control state diagram. The RECOVERY state coupled with the absence of timeouts, introduces a new challenge in identifying marginal performance cases. These cases may lead to repeated transitions between TRAIN_LOCAL/TRAIN_REMOTE/SEGMENT_READY state to/from RECOVERY state in scenarios of alternating local_tf_lock. A possible solution is to limit the number of RECOVERY events by counting and limiting the number of transitions to the RECOVERY state.

**Suggested Remedy**

Define a new counter: \( \text{recovery
d_event_count} \). This counter increments each time the control state diagram transitions into the RECOVERY state.

**Effects on the state diagram:**
The \( \text{recovery
d_event_count} \) should be initialized to 0 in the \( \text{SEND
tRAINING} \) state. Upon entering the RECOVERY state, the \( \text{recovery
d_event_count} \) should be incremented by 1.

**State diagram transition change:**
The transition condition from the RECOVERY state to the FAIL state needs to be modified as follows:
Change \( \text{recovery
timer
done} \) to \( \text{recovery
timer
done} + \text{max_recovery
d_events} \neq 0 \times \text{recovery
d_event_count} \geq X \), where X is 5 (or to be determined).

**Comment Status**

A

**Response Status**

C

**ILT Diagrams (common)**

Rechtman, Zvi
Nvidia

**Comment Type**

T

**Response**

In Figure 176A-6.
Initialize "recovery
d_event_count" to 0 in the "SEND
tRAINING" state.
In the RECOVERY state increment the "recovery
d_event_count" by 1.
Modify the transition condition from the RECOVERY state to the FAIL state as follows.
Change "recovery
timer
done" to "recovery
timer
done + \text{max_recovery
d_events}".

**Suggested Remedy**

The WAIT_ADJACENT to SWITCH_CLOCK transition condition uses the variable \( \text{mr_training
d_enabled} \), however subclause 176A.10.2.1 'Variables' defines the variable \( \text{mr_training
d_enable} \). Changing the transition condition ' (!mr_training
d_enabled + segment
d_ready) * ...' to read ' (!mr_training
d_enable + segment
d_ready) * ...'.

**Response**

ACCEPT.

**ILT Diagrams (Bucket)**

Law, David
HPE

**Comment Type**

E

**Suggested Remedy**

Subclause 176A.10.1 'State diagram conventions' says that 'The notation used in the state diagrams follows the conventions of 21.5.3'. Subclause 21.5.3 'State transitions' says 'The following terms are valid transition qualifiers:' and item d) says 'An unconditional transition: UCT'. As a result, it is not necessary to expand UCT on its first use in Annex 176A.

**Response**

ACCEPT IN PRINCIPLE.

**ILT Diagrams (Bucket) (editorial)**

Law, David
HPE

**Comment Type**

E

**Suggested Remedy**

Implement the following with editorial license.

Define a new variable in 176A.10.3.1 as follows:
"max_recovery
d_events. Integer variable that controls the maximum allowed number of transitions into the RECOVERY state in the Interface control state diagram (Figure 176A-6). A value of zero allows unlimited number of transitions. The value of this variable is implementation dependent."

Define a new counter in 176A.10.3.4 as follows:
"recovery
d_event_count. This counter increments each time the control state diagram (see Figure 176A-6) transitions into the RECOVERY state."

**Response**

ACCEPT IN PRINCIPLE.

**ILT Diagrams (Bucket) (editorial)**
The UPDATE_IC function is called in the OUT_OF_SYNC state of the Figure 176A.6.2 Coefficient update state diagram. The UPDATE_IC function uses the ic_req variable to set the coefficients (see 176A.6.2), and the ic_req variable is derived from the 'initial condition request' bits from the control field of the received training frames (see 176A.10.3.1).

Since, however, the OUT_OF_SYNC state is entered during reset (reset or mr_restart set true), it would seem unlikely that training frames are being received. If that is the case, it isn't clear what the value of the ic_req variable is, and therefore what the coefficients should be set to.

176A.6.2 says that 'The transmitter equalizer is set to preset 1 upon entry to the QUIET state of the interface control state diagram'. Since the QUIET state of the Interface control state diagram is also entered during reset, it seems the coefficients should be set to preset 1 when the Coefficient update state diagram is in the OUT_OF_SYNC state.

**Suggested Remedy**

1. Delete the first sentence of the ic_req definition in 176A.10.3.1.
2. Add the text 'If the Coefficient update state diagram is in the OUT_OF_SYNC state ic_req is set to preset 1. Otherwise, it is derived from the "initial condition request" bit of the control field of received training frames on the correspondent lane of the interface.' to the end of the ic_req definition in 176A.10.3.1.

**Response**

Response Status: C

ACCEPT IN PRINCIPLE.

Slides 12 through 14 of the following presentation, prepared by the editorial team, was reviewed by the CRG.


Implement the proposal on slides 13 and 14 of brown_3dj_02a_2406.pdf with editorial license.

---

**Comment Type:** ER  **Comment Status:** A  **Sort Order:** Clause, Subclause, page, line

**Figure 176A-6 has an extraneous < in the name 'local_tf_lock'<"**

**Suggested Remedy**

change to 'local_tf_lock'

**Response**

Response Status: C

ACCEPT IN PRINCIPLE.

Implement editorial license and discretion.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

Comment Type TR Comment Status A
Transmitter measurement bandwidth is TBD

SuggestedRemedy
Replace TBD with 62 GHz

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #60.

Comment Type T Comment Status A
Typo.

SuggestedRemedy
Change "106.255" to "106.25".

Response Response Status C
ACCEPT.

Comment Type TR Comment Status A
The value of '106.25 +/- 50 ppm' is not correct.

SuggestedRemedy
Change '106.255' to '106.25'.

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #361.

Comment Type E Comment Status A
Where does the value for SNDR of 32.5dB come from?

SuggestedRemedy
No change suggested, looking for source material

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement with editorial license and discretion.

Comment Type TR Comment Status A
Reference to ERL methodology is missing

SuggestedRemedy
Add reference to 176D.4.3.

Response Response Status C
ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
### Comment #425

**Comment Type**: TR  
**Comment Status**: A  
**B-T filter BW**

- **Suggested Remedy**
  - Replace TBD with 62 GHz

- **Response**
  - Response Status: C
  - Accept in principle. Resolve using the response to comment #60.

### Comment #426

**Comment Type**: TR  
**Comment Status**: A  
**Nyquest frequency in Table 176D.4 is incorrect**

- **Suggested Remedy**
  - Change "26.5625 GHz" to "53.125 GHz"

- **Response**
  - Response Status: C
  - Accept.

### Comment #427

**Comment Type**: TR  
**Comment Status**: A  
**COM values in Table 176D.4 are TBD**

- **Suggested Remedy**
  - Replace TBD with 3 dB

- **Response**
  - Response Status: C
  - Accept in principle. Resolve using the response to comment #250.

### Comment #428

**Comment Type**: TR  
**Comment Status**: A  
**Reference to test procedure is missing**

- **Suggested Remedy**
  - Add reference to 176D.3.4.4

- **Response**
  - Response Status: C
  - Accept.

### Comment #430

**Comment Type**: TR  
**Comment Status**: A  
**Minimum COM is TBD**

- **Suggested Remedy**
  - Replace TBD with 3 dB in Table 176D.4 and in line 38 of page 604

- **Response**
  - Response Status: C
  - Accept in principle. Resolve using the response to comment #250.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

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<td>MediaTek</td>
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<td>Table reference is missing</td>
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<td>Add reference of ERL to 176D.4.3.</td>
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<td>Socionext</td>
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<td>COM pkg tau (bucket)</td>
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<td>COM reference package parameter value. (transmission line parameter tau)</td>
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<tr>
<td>In &quot;Table 176D06&quot; class A package model Transmission line parameter t(tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, llim_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.</td>
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<td>Suggested Remedy</td>
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<tr>
<td>Change t(tau) value in Table 176D-6 (class A package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.</td>
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<tr>
<td>Or simply delete this row, as the t(tau) value in table 93A-3 is 6.141e-3 ns/mm.</td>
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<td>Response</td>
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<tr>
<td>Resolve using the response to comment #118.</td>
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<td>Ro= 50 ohms</td>
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<td>Response</td>
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<td>Transmitter equalizer coefficients</td>
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<td>Given little benefit of TX FFE C(-3) - NA</td>
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<td>C(1)=[ -0.14:0.02:0.14 ] also goes positive to allow slowing driver for reflection mitigation</td>
<td></td>
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<td></td>
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<tr>
<td>Response</td>
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<td>Response Status</td>
<td>C</td>
<td></td>
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</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
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<td></td>
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<tr>
<td>Resolve using the response to comment #37.</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>176D</th>
<th>SC 176D.4.1</th>
<th>P605</th>
<th>L.26</th>
<th>#123</th>
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<tbody>
<tr>
<td>Sakai, Toshiaki</td>
<td>Socionext</td>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
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<tr>
<td>COM pkg tau (bucket)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM reference package parameter value. (transmission line parameter tau)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In &quot;Table 176D06&quot; class B package model Transmission line parameter t(tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, llim_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.</td>
<td></td>
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</tr>
<tr>
<td>Suggested Remedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change t(tau) value in Table 176D-6 (class B package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Or simply delete this row, as the t(tau) value in table 93A-3 is 6.141e-3 ns/mm.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td></td>
<td>Response Status</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
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<tr>
<td>Resolve using the response to comment #118.</td>
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<table>
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<th>P605</th>
<th>L.35</th>
<th>#331</th>
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<tr>
<td>Li, Tobey</td>
<td>MediaTek</td>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>A</td>
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<td>R_0</td>
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<td></td>
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<tr>
<td>Single-ended reference resistance R0 value in Table 176D06 is TBD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace TBD with 50 Ohm</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td></td>
<td>Response Status</td>
<td>C</td>
<td></td>
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<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Resolve using the response to comment #403.</td>
<td></td>
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</tbody>
</table>
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

**Comment Type: TR**  **Comment Status: A**  
Receiver 3 dB bandwidth fr value in Table 176Dû7 is TBD

**Suggested Remedy:**
Replace TBD with 0.58*fb

**Response**
ACCEPT IN PRINCIPLE. Resolve using the response to comment #36.

---

**Comment Type: T**  **Comment Status: A**
C2C reference equalizer should be aligned with C2M and addressing TBDs

**Suggested Remedy:**
Propose to use fix 25 tap FFE with 1T DFE  
Max # of pre-cursor taps = 6  
DFE max tap weight = 0.75

**Response**
ACCEPT IN PRINCIPLE. Resolve using the response to comments #504 and #279.

---

**Comment Type: TR**  **Comment Status: A**  
Zero 2 frequency and pole 3 frequency of Continuous time filter are inconsistent with Table 178013

**Suggested Remedy:**
Replace zero 2 frequency with fb/80  
Change pole 3 frequency from "fb" to "fb/80"

**Response**
ACCEPT IN PRINCIPLE.

---

**Comment Type: T**  **Comment Status: A**  
Transmitter differential peak output in Table 176Dû7 is TBD

**Suggested Remedy:**
Replace Av with 0.413 V  
Replace Afe with 0.413 V  
Replace Ane with 0.608 V

**Response**
ACCEPT IN PRINCIPLE.

---

There are several comments on this topic. The editorial team prepared a proposal in slide 15 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01b_2406.pdf.

Use the CTLE parameters from Table 178-13 (which are identical to those in Table 179-16), without change, in Table 176D-6 and C2M (Table 176E-7 and COM parameters table).

Remove FLF from Table 176D-7.

Implement with editorial license.

---

The following presentation was reviewed by the task force in the May 2024 interim meeting: https://www.ieee802.org/3/dj/public/24_06/lusted_3dj_01a_2406.pdf

Use the values from slide 4 of the presentation, A_v=A_fe=0.413 and A_ne=0.45, to replace TBD values in Table 176D-7.

Add the editor's note on slide 5 of the presentation.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
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</thead>
<tbody>
<tr>
<td>TR</td>
<td>A</td>
<td>Replace TBD with Tr = 4 ps</td>
</tr>
</tbody>
</table>

**Response**

Accept in principle.

Resolve using the response to comment #39.

---

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>TR</td>
<td>A</td>
<td>Replace TBD with 0.95</td>
</tr>
</tbody>
</table>

**Response**

Accept in principle.

Resolve using the response to comment #273.

---

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
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</thead>
<tbody>
<tr>
<td>TR</td>
<td>A</td>
<td>Replace TBD with 32</td>
</tr>
</tbody>
</table>

**Response**

Accept in principle.

Resolve using the response to comment #360.

---

**Comment Type:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

**Comment Status:** D/dispatched  A/accepted  R/rejected  Response Status: O/open  W/written  C/closed  Z/withdrawn

**Sort Order:** Clause, Subclause, page, line

**Page:** 54 of 139  
**Date:** 6/13/2024 3:31:04 PM
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

---

**Comment Type**: T  **Comment Status**: A  **Channel ILdd (bucket1p)**

Figure depicts loss should be bump-bump

**Suggested Remedy**: ...

To make it more clear Host C2M Component should be changed to Host C2M Device and Module C2M Device

**Response**: ACCEPT IN PRINCIPLE.

The C2M loss budget is currently TBD, but it is expected that it will be inclusive of packages. However, the suggested remedy does not significantly clarify this fact.

Add an editor's note stating that the losses in the diagram are intended to be die to die, and contributions are encouraged.

---

**Comment Type**: T  **Comment Status**: R  **Channel ILdd**

Loss budgets are TBD

**Suggested Remedy**: See Ghiasi C2M May-24 Contribution for background on the numbers

IIoD=28 dB

Connector with one via = 3 dB

Module lldd = 3.6 dB

Host llld=21.4 dB

**Response**: REJECT.

The comment is against Figure 176E-2.

The following presentation was reviewed by the task force in the May 2024 interim meeting:


The comment addresses several open TBDs and the suggested remedy is reasonable, but consensus is not obvious.


Comment #73 suggests 33 dB for the Channel ILdd.

There is no consensus for adopting values. More work toward consensus loss budget for C2M in conjunction with reference receiver parameters is encouraged.

---

**Comment Type**: TR  **Comment Status**: A  **C2M output**

Host output characteristics need to be defined with consideration of the variable output settings that can result from training.

This will affect the entire subclause 176E.3.3.

**Suggested Remedy**: Define the output characteristics using a methodology similar to that of transmitter specifications in 179.9.4.

Use a table similar to Table 179-7 but with different values due to the higher host channel insertion loss budget for C2M.

A detailed proposal will be provided.

**Response**: ACCEPT IN PRINCIPLE.

The CRG reviewed the editorial team's notes on slides 32-34 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01d_2406.pdf.

Implement the proposed changes on slides 6 and 8 of https://www.ieee802.org/3/dj/public/24_05/ran_3dj_02_2405.pdf, except that for jitter values use the values adopted by comment #204.

In the methodology subclause 176E.5, delete the current content and point to the relevant subclauses of 179.9.4.

Implement with editorial license.

The following straw poll was taken:

Straw poll #E-5 (decision)

I would support implementing the proposed changes on slides 6 and 8 of ran_3dj_02_2405 except that for jitter values use the values adopted by comment #204.

Y: 17 N: 14 A: 9

---

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

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

**SORT ORDER**: Clause, Subclause, page, line

---

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EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

131

Comment Type T Comment Status A 3 dB BW is TBD

Suggested Remedy
- propose to use 0.55*Baudrate=58.4375 GHz but in current OCM code we use Butterworth, should the COM for C2M be changed to BT4 filter?

Response
- Accept in principle. Resolve using the response to comment #60.

132

Comment Type T Comment Status A Eye height and VEC are TBD

Suggested Remedy
- See Ghiasi C2M May-24 Contribution for background on the numbers VEC=10.7 dB VEO=8 mV

Response
- Accept in principle. Resolve using the response to comment #186.

133

Comment Type TR Comment Status A Module output characteristics need to be defined with consideration of the variable output settings that can result from training. This will affect the entire subclause 176E.3.4.

Suggested Remedy
- Define the output characteristics using a methodology similar to that of transmitter specifications in 179.9.4. Use a table similar to Table 179-7 but with different values due to the lower insertion loss assumed for the module output test.

Response
- Accept in principle. Resolve using the response to comment #186.
Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns.

**Suggested Remedy**
Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host-facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"

**Response**
REJECT.
Resolve using the response to comment #227.

---

Host input characteristics need to be defined with consideration of the availability of training. This will affect the entire subclause 176E.3.5.

**Suggested Remedy**
Define the input characteristics using a methodology similar to that of receiver specifications in 179.9.5, with the required changes due to the lack of a cable assembly.

Use a table similar to Table 179-10 but with additional rows for DC common-mode voltage and AC common-mode voltage tolerance.

A detailed proposal will be provided.

**Response**
ACCEPT IN PRINCIPLE.

Implement the proposed changes on slides 6-8 of https://www.ieee802.org/3/dj/public/24_05/ran_3dj_01_2405.pdf, with the following exceptions:
- On slide 6, the host input test calibration (based on Figure 110-3b) on bottom left should not use the frequency-dependent attenuator. Instead, a mathematical channel representing the maximum host channel is to be used, with details TBD.
- On slide 7, use TBD instead of 35 dB for module input test 1 and test 2 and for host input test calibration.

Implement with editorial license.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

Cl 176E SC 176E.3.6 P628 L26 #189
Ran, Adee Cisco

Comment Type TR Comment Status A C2M input
Module input characteristics need to be defined with consideration of the availability of training.
This will affect the entire subclause 176E.3.6.

Suggested Remedy
Define the input characteristics using a methodology similar to that of receiver specifications in 179.9.5, with the required changes due to the lack of a cable assembly and usage of MCB instead of HCB.
Use a table similar to Table 179-10 but with additional rows for DC common-mode voltage tolerance and AC common-mode voltage tolerance.
A detailed proposal will be provided.

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #188.

Cl 176E SC 176E.4.1 P632 L6 #134
Ghiasi, Ali Ghiasi Quantum/Marvell

Comment Type T Comment Status R (bucket1p)
Loss is TBD

Suggested Remedy
See Ghiasi C2M May-24 Contribution for background on the numbers
Bump-bump Insertion loss at Nyquist frequency (53.125 GHz) is less than or equal to 28 dB

Response Response Status C
REJECT.
[Editor’s note: changed page from 621 to 632]
The following presentation was reviewed by the task force in the May 2024 interim meeting:
The presentation does not include a proposal for equation 176E-3.
Resolve using the response to comment #130.
The COM parameter values for the AUI C2M electrical interfaces in Annex 176E are different from the AUI C2C.

**Suggested Remedy**

Create a new COM parameter values table in 176E.4.2 and use the COM parameter values from https://www.ieee802.org/3/dj/public/24_03/lit_3dj_01a_2403.pdf slide 6 and 11, which are:

- \( f_r = 0.58 \)
- \( c(-3) = 0 \)
- \( c(-2) = 0 \text{ min}, 0.12 \text{ max} \)
- \( c(-1) = -0.4 \text{ min}, 0 \text{ max} \)
- \( c(0) = 0.54 \)
- \( c(1) = 0 \)
- \( A_v = 0.413 \)
- \( A_{fe} = 0.413 \)
- \( A_{ne} = 0.45 \)
- \( e_{fa} = 1.25e-8 \)
- \( SNR_{TX} = 33 \)
- \( \sigma_{RJ} = 0.01 \)
- \( \eta_0 = 1.25e-8 \)
- \( \text{SNR}_{TX} = 33 \)
- \( \sigma_{RJ} = 0.01 \)
- \( A_{DD} = 0.02 \)
- \( R_{LM} = 0.95 \)
- \( d_w = 5 \)
- \( N_{fix} = 10 \)
- \( N_g = 1 \)
- \( N_{f} = 4 \)
- \( N_{max} = 60 \)
- \( w_{max}(1) = 1 \)
- \( w_{min}(1) = 0 \)
- \( b_{max}(1) = 0.75 \)
- \( b_{min}(1) = 0 \)

Additionally, set MLSE = 0 (not enabled).

**Response**

Implement with editorial license.

**Suggested Remedy**

Measurement methodology for C2M should consider the variable output settings that can result from training. Eye opening parameters with specific transmitter settings are not the relevant metrics for transmitter quality anymore.

The measurement methodology of CR transmitter, which focuses on training-related equalizer parameters and training-independent signal parameters, is more suitable.

**Suggested Remedy**

Move the measurement methodology section into another annex that both Clause 179 and Annex 176E can refer to.

A detailed proposal will be provided.

**Response**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #186.

**Suggested Remedy**

Update this text

**Response**

ACCEPT IN PRINCIPLE.

Comments #186 through #189 suggest using the CR methodology for transmitter and receiver specifications. Based on resolution of these comments, the text subject of this comment will no longer be in the the next draft.

Resolve using the response to comment #186.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

Comment Type: T  Comment Status: R

Eye opening reference receiver parameters will be different between TP1d and TP4a measurement.

Suggested Remedy:
Given that number of module plug implementation will have COC or even if there is package it will be core-less ~8 mm so there is no need to add package after HCB given the loss of the HCB and plug boards are similar. At TP4a this is just the output of the module should be tested with synthetic - short trace - long trace recommendation is to measure at the ASIC ball otherwise we would need at least 2 test cases with Package A and 2 with Package B.

Response Response Status: C
The suggested remedy does not propose an actionable (within the draft) remedy.

Comment Type: TR  Comment Status: A

The title of Table 176E-7 suggests that is should contain reference receiver parameters. Many of the parameters in the table are not relevant to a reference receiver or an eye diagram measurement. It is understood that this may become moot if a different test method is adopted, but until this decision is made the table can be trimmed down to remove “TBDs” that will never need to be defined.

Suggested Remedy:
Remove parameters "maximum start frequency", "maximum frequency step", all "transmitter" parameters including "number of signal levels" and "level separation mismatch ratio", "number of samples per unit interval", and "target detector error ratio". It is also questionable whether device termination and package model parameters are needed (they were not used in Annex 120G).

Response Response Status: C
ACCEPT IN PRINCIPLE. Comments #186 through #189 suggest using the CR methodology for transmitter and receiver specifications. Based on resolution of these comments, the reference receiver table has been replaced by a COM parameters table.

Resolve using the response to comment #186.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Comment #137

Single ended receive termination and receive 3 dB BW

Comment Type: T
Comment Status: A

SuggestedRemedy

Single ended receive termination is the 50 ohm scope termination
Receive 3 dB BW=0.55*106.25=58.4375 GHz

Response

Response Status: C
ACCEPT IN PRINCIPLE.

Comments #186 through #189 suggest using the CR methodology for transmitter and receiver specifications. Based on resolution of these comments, the reference receiver table has been replaced by a COM parameters table.

Resolve using the response to comment #186.

Comment #439

Receiver 3 dB bandwidth fr value in Table 176Eû7 is TBD

Comment Type: TR
Comment Status: A

SuggestedRemedy

Replace TBD with 0.58*fb

Response

Response Status: C
ACCEPT IN PRINCIPLE.

Resolve using the response to comment #36.

Comment Type: T
Comment Status: A

Transmitter equalizer coefficients

SuggestedRemedy

Given little benefit of TX FFE C(-3) - NA
C(0)=0.65
C(-1)= [-0.3:0.02:0 ]
C(-2)= [ 0.02:0.14 ]
C(1)= [ -0.14:.02:0.14 ] also goes positive to allow slowing driver for reflection mitigation

Response

Response Status: C
ACCEPT IN PRINCIPLE.

Resolve using the response to comment #37.
<table>
<thead>
<tr>
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<th>Comment</th>
<th>Page</th>
<th>Line</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
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<tr>
<td>176E</td>
<td>176E.5.2</td>
<td>P634</td>
<td>L34</td>
<td>#440</td>
<td></td>
<td></td>
<td>Pole &amp; zero frequency values of continuous time filter are TBD</td>
<td></td>
<td></td>
<td>A</td>
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<tr>
<td>Li, Tobey</td>
<td>MediaTek</td>
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<td>P634</td>
<td>L43</td>
<td>#441</td>
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<td>Transmitter transition time Tr value in Table 176Eû7 is TBD</td>
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<td>Number of samples per unit interval in Table 176Eû7 is TBD</td>
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<td>#39</td>
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<td>Jitter and noise parameters are TBD</td>
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<td>Level separation mismatch ratio RLM in Table 176Eû7 is TBD</td>
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<tr>
<td>Li, Tobey</td>
<td>MediaTek</td>
<td>TR</td>
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**TYPE:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

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

**SORT ORDER:** Clause, Subclause, page, line
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

**Comment Type TR**  
"Dp equal to 3" is not right as there are 3 pre-taps for the host  
**SuggestedRemedy**  
Change "Dp equal to 3" to "Dp equal to 4"  
**Response**  
ACCEPT IN PRINCIPLE.  
Resolve using the response to #30.

**Comment Status A**

<table>
<thead>
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<th>Comment Type</th>
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<td>Cl 176E SC 176E.5.2</td>
<td>P635</td>
<td>L35</td>
<td># 144</td>
</tr>
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<td>Li, Tobey</td>
<td>MediaTek</td>
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**Comment Type TR**  
"within the time interval t_s +/-0.05 UI and with accumulated probability for each sample weighted by the function w(t) defined by Equation (176E-4)": this makes the measurement too tolerant to jitter.  
**SuggestedRemedy**  
Remove the Gaussian weighting function w(t), increase +/-0.05 to +/-0.07, same as TDECO. This will make VEC look worse, but will be a better measurement to protect the link. Use this method for CR also, with "software channel" ("far end eye measurement") as appropriate.  
**Response**  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #186.

**Comment Status A**

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<td>P636</td>
<td>L49</td>
<td># 523</td>
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<td>Dawe, Piers</td>
<td>Nvidia</td>
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**Comment Type T**  
This section only mentions that the inner FEC decoder is soft-decision decoder and the details implementation is beyond the scope of the this standard. However, shall we specify the soft-decision decoder's performance bound? If not, the optical PMD BER target or link budget might be missed.  
**SuggestedRemedy**  
To specify the soft-decision decoder shall provide TBD dB (say 2dB) coding gain over end-end FEC provided that the error statistics are sufficiently random.  
**Response**  
REJECT.  
Specifying the effectiveness of the Inner FEC is not as simple a coding gain. It needs include the relationship between the errors on the input, errors on the output, and the effect those errors have on the RS-FEC.  
A consensus presentation to appropriately define the expected Inner FEC performance is encouraged.

**Comment Status R**

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<td>P257</td>
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<td># 22</td>
</tr>
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<td>Liu, Cathy</td>
<td>Broadcom</td>
<td></td>
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**Comment Type T**  
Reference equalizer is TBD  
**SuggestedRemedy**  
Propose to use fix 25 tap FFE with 1T DFE  
Max # of pre-cursor taps = 6  
DFE max tap weight = 0.75  
**Response**  
ACCEPT IN PRINCIPLE.  
Resolve using the responses to comments #72 and #279.

**Comment Status A**

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<td>Cl 177 SC 177</td>
<td>P257</td>
<td>L28</td>
<td># 22</td>
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<td>Ghias Quantum/ Marvell</td>
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**Comment Type T**  
Comment ref Rx

**Comment Status A**

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<tr>
<td>Cl 177 SC 177</td>
<td>P257</td>
<td>L28</td>
<td># 22</td>
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<tr>
<td>Liu, Cathy</td>
<td>Broadcom</td>
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**Comment Type T**  
This section only mentions that the inner FEC decoder is soft-decision decoder and the details implementation is beyond the scope of the this standard. However, shall we specify the soft-decision decoder's performance bound? If not, the optical PMD BER target or link budget might be missed.  
**SuggestedRemedy**  
To specify the soft-decision decoder shall provide TBD dB (say 2dB) coding gain over end-end FEC provided that the error statistics are sufficiently random.  
**Response**  
REJECT.  
Specifying the effectiveness of the Inner FEC is not as simple a coding gain. It needs include the relationship between the errors on the input, errors on the output, and the effect those errors have on the RS-FEC.  
A consensus presentation to appropriately define the expected Inner FEC performance is encouraged.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

---

**Cl 177  SC 177.1.3  P249  L10  # 81**

Huber, Thomas  
Nokia  

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

*The second bullet could be written more clearly*

**Suggested Remedy**  
Revise to read "Distributing (collecting) the convolutional interleaved data to (from) eight Inner FEC flows"

**Response**  
**Response Status**  C  
**ACCEPT.**

---

**Cl 177  SC 177.1.3  P249  L14  # 82**

Huber, Thomas  
Nokia  

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

*The fifth bullet could be written more clearly*

**Suggested Remedy**  
Revise to read "8:1 interleaving (1:8 deinterleaving) the eight Inner FEC flows to (from) a single flow"

**Response**  
**Response Status**  C  
**ACCEPT.**

---

**Cl 177  SC 177.1.4  P250  L25  # 83**

Huber, Thomas  
Nokia  

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

*Indicating PAM4 decoding as optional seems a bit misleading. The P{MD isn't doing soft-decoding in any case, so the FEC must do some sort of decoding to recover the bits from the PAM4 symbols.***

**Suggested Remedy**  
Generalize the label in the box to "Decoding", and explain in the text in 177.5.x that there are multiple options for decoding.

**Response**  
**Response Status**  C  
**ACCEPT IN PRINCIPLE.**

Remove footnote in Figure 177-2.

---

**Cl 177  SC 177.1.4  P250  L32  # 84**

Rechtman, Zvi  
Nvidia  

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

*The comment refers to Figure 177.2. There is a footnote that PAM4 decoding is optional in case of soft decoding. However, the PathData is defined using bit streams, also the FEC:IS_UNITDATA_i.indication primitives has two value of 0 or 1, therefore PAM4 decoding must to take place*

**Suggested Remedy**  
Either remove the footnote, or elaborate on the intention of this footnote.

**Response**  
**Response Status**  C  
**ACCEPT IN PRINCIPLE.**

Resolve using the response to comment # 83.

---

**Cl 177  SC 177.4.1  P251  L36  # 805**

de Koos, Andras  
Microchip Technology  

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

*Due primarily to the convolutional interleaver/deinterleaver, there is a large variation in the input-to-output latency of the Inner FEC sublayer. As such, there is concern that the method to properly calculate the path data delay for the Inner FEC sublayer should be explained in Clause 90, similarly to what is done for the variation from FEC codewords and PCS-lane distribution in clause 90.7.1.*

**Suggested Remedy**  
Do nothing.

Using the general method in Clause 90A, allocating the maximum value of the intrinsic delay to the transmit PHY and the minimum value of the intrinsic delay to the receive PHY, there is no ambiguity.

So it should not be necessary to add to Clause 90 for every new PHY type. The principles laid out in Annex 90A.7 should apply. If anything, a general note could be added in Clause 177 (or in Clause 45 with the MDIO registers for path data delay values) explaining that the Tx/Rx path data delay values should be calculated following the guidelines in Annex 90A.7, where the maximum latency value is used for the Tx path data delay, and the minimum latency value is used for Rx path data delay.

**Response**  
**Response Status**  C  
**REJECT.**

The suggested remedy does not propose an actionable (within the draft) remedy. It is not helpful to sprinkle notes related to time synchronization throughout the various sublayer clauses; this was not done in previous clauses/projects. Rather it would be preferable to add the necessary text into Clause 90/Annex 90A. A consensus presentation with a complete proposal is encouraged.

---

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

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

**SORT ORDER:** Clause, Subclause, page, line  
**Page 64 of 139  6/13/2024  3:31:04 PM**
The convolutional interleaver is composed of 3 delay lines where the first delays the PHYs data by eight RS-FEC codewords, the second by four RS-FEC codewords and the last adds no delay. The Q values should be 192/96/48/24 as shown in slides 6-11 of he_3dj_01_2307.pdf for 200G/400G/800G/1.6TbE.

**Suggested Remedy**

Suggest to modify Line 50-51 in page 251 as follows:

The convolutional interleaver is composed of three parallel delay lines (numbered 0 to 2), as illustrated in Figure 177-3. Each delay operator ôDö represents a storage element of 40 bits. From one delay line to the next higher delay line, Q delay operators are deleted. Modify the Q values to 192/96/48/24 for 200G/400G/800G/1.6TbE.

**Response**

ACCEPT IN PRINCIPLES.

Resolve using the response to comment #366.

---

### Comment: #366

**Comment Type:** TR

**Comment Status:** A

**Cl (bucket):** CI

**Comment:**

The values of Q and the description of the Convolutional interleaver functionality doesn't match the adopted values in he_3dj_01_2307.pdf. The values should be:

- 200G BASE-R: Q = 192
- 400G BASE-R: Q = 96
- 800G BASE-R: Q = 48
- 1.6T BASE-R: Q = 24

**Suggested Remedy**

According to the adopted baseline, change the Q values as follows:

- 200G BASE-R: Q = 192
- 400G BASE-R: Q = 96
- 800G BASE-R: Q = 48
- 1.6T BASE-R: Q = 24

**Response**

ACCEPT IN PRINCIPLES.

Implement the suggested remedy with editorial license.

---

### Comment: #295

**Comment Type:** T

**Comment Status:** A

**Cl (bucket):** CI

**Comment:**

Usually, a convolutional interleaver switches round-robin from low to high delay lines and the convolutional de-interleaver switches round-robin from high to low delay lines. Why in Figure 177-3 it is defined the other way round?

**Suggested Remedy**

Change the convolutional interleaver order if that is the case.

**Response**

REJECT.

This is consistent with the adopted baseline. It is correct as documented.
The delay line for CI177 starts with feeding data into the longest delay line while CI184 sends it to the delay line with the shortest delay.

SuggestedRemedy
Change CI177 to have the Delay Line 0 be the minimal delay and the Delay Line 2 to be the longest delay.

Response
This is consistent with the adopted baseline. It is correct as documented.

Modify to:
"The convolutional interleaver is composed of 3 delay lines. For 200GBASE-R the first line (line0) delays the PHYs data by 4x2x192 = 1,536 RS-FEC Symbols, the second line (line1) by 4x1x192 = 768 RS-FEC symbols and the last line (line3) adds no delay. For 400GBASE-R the first line (line0) delays the PHYs data by 4x2x96 = 768 RS-FEC Symbols, the second line (line1) by 4x1x96 = 384 RS-FEC symbols and the last line (line3) adds no delay. For 800GBASE-R the first line (line0) delays the PHYs data by 4x2x48 = 384 RS-FEC Symbols, the second line (line1) by 4x1x48 = 192 RS-FEC symbols and the last line (line3) adds no delay. For 1.6TBASE-R the first line (line0) delays the PHYs data by 4x2x24= 192 RS-FEC Symbols, the second line (line1) by 4x1x24 = 96 RS-FEC symbols and the last line (line3) adds no delay.

Response
Implement the suggest remedy with editorial license.

I'm not convinced that the circular shift really adds any robustness. Yes, it distances bit-pairs belonging to the same RS-FEC codeword, but Without the shift, the consecutive bit pairs (after 8:1 multiplexing) belonging to the same RS-FEC code words would each protected by different Inner FEC code words, would they not? So is the circular shift just protecting against uncorrected inner-FEC codewords that would all land on the same RS-FEC codeword? Seems overkill. Are there simulations/models showing the benefit of including circular shift?

SuggestedRemedy
Consider removing the circular shift if it does not offer any worthwhile benefit.

This comment was WITHDRAWN by the commenter.
### Comment 177 SC 177.4.3 P252 L37 # 607

**Comment Type:** T  **Comment Status:** R  **Circular Shift (bucket)**

Was there not a proposal to make the circular shift optional, in order to minimize latency?

**Suggested Remedy:**
Consider removing the circular shift if it does offer not any worthwhile benefit.

**Response**  **Response Status:** Z

This comment was WITHDRAWN by the commenter.

---

### Comment 177 SC 177.4.4 P253 L48 # 612

**Comment Type:** T  **Comment Status:** A  **inner FEC code (bucket)**

"The generation matrix G(60,8) for the Hamming(68,60) encoder is given in Table 177-1" is not accurate. The generation matrix for the Hamming(68,60) should be with 60 rows and 68 columns, where the most-left 60 columns is the identity matrix.

**Suggested Remedy:**
Suggest to change the sentence to "The generator matrix of the Hamming(68,60) code is G=[I_60 ; G_(60x8)], where I_60 is the 60x60 identity matrix, and G_(60x8) is a 60x8 matrix used to generate the 8 parity bits given in Table 177-1."

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

ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the 802.3dj task force at the May Interim meeting.
https://www.ieee802.org/3/dj/public/24_05/huang_3dj_01a_2405.pdf

Implement the suggested remedy with editorial license.

---

### Comment 177 SC 177.4.6 P254 L # 608

**Comment Type:** T  **Comment Status:** A  **pad insertion (bucket)**

A figure illustrating the pad bits and their interval for each inner FEC flow would be useful.

**Suggested Remedy:**
Consider adding a figure illustrating the pad insertion and interval, in the same style as Figure 119-6

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

ACCEPT IN PRINCIPLE.

Implement the suggest remedy with editorial license.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

Comment Type: T  Comment Status: R  timesync (bucket)

Phase of inner FEC pad bits vs outer FEC parity bits:
- An inaccuracy in the path data delay of up to 12ps due to arbitrary phase between the output FEC parity bits and the inner FEC pad bits of the phase is not accounted for.
- This arbitrary phase would affect the path data delay values.
- Almost negligible, if my math is correct.

SuggestedRemedy
3 possible ways to address:
a. Impose a phase relationship between the RS FEC code word boundaries and the inner FEC pad bits, which would mean large-scale changes to the draft.
b. Specify (in clause 90, perhaps) that the path data delay contribution through the inner FEC sublayer shall be strictly additive to the path data delay contribution through the PCS and PMA layers.
c. Ignore. Based on 90A.7, the effect here is small enough to not address specifically.
"Whether the potential delay difference between the aggregated delay and the sum of the individual function delays is small enough to satisfy the timing requirements is up to the individual application."
I prefer option (c). It should not be necessary to add specific text or impose new logical rules to the Inner FEC pad bits to address a potential 12ps path data delay impairment.

Response  Response Status: C
REJECT.
The following related presentation was reviewed by the 802.3dj task force at the May Interim meeting. https://www.ieee802.org/3/dj/public/24_05/he_3dj_01a_2405.pdf
It appeared that there was no consensus to make any related changes to the draft.

Comment Type: T  Comment Status: A  pad insertion (bucket)

It is not declared when the first pad insertion should happen.

SuggestedRemedy
Indicate in the text that the first pad insertion will happen right at the beginning of CWs, same as in the test vectors.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
Implement the suggest remedy with editorial license.

Comment Type: T  Comment Status: A  pad insertion (bucket1p)

The last paragraph describing options for how the pad insertion could be done is unnecessary. The requirement that it occurs every 8704 CW and follows the Figure 177-6 is sufficient.

SuggestedRemedy
Remove the last paragraph of 177.4.6

Response  Response Status: C
ACCEPT.

Comment Type: T  Comment Status: A  pad insertion (bucket1p)

"Pad frame sequence" naming does not convey purpose in alignment. Suggest to call this field "Frame Alignment Sequence" instead.

SuggestedRemedy
Pad Frame Alignment Sequence

Response  Response Status: C
ACCEPT IN PRINCIPLE.
Implement with editorial license and discretion.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

**Comment 177 SC 177.4.6.2 P255 L49 # 297**

Galan, Jose Vicente Maxlinear Inc

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

The details of how to use the IBSF are beyond the scope of this standard. Does it mean this is vendor discretionary? Or will it be defined in other standard?

**Suggested Remedy**

Clarify in the text where the use of the IBSF will be defined.

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

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

**Comment 177 SC 177.4.7.2 P256 L12 # 547**

Rechtman, Zvi Nvidia

**Comment Type TR**  **Comment Status A**

The 128,120 Hamming code is very sensitive to error propagation since it can correct up to one error in hard decoding and three errors in soft decoding. Hence, precoding is required.

**Suggested Remedy**

Add precoding, and use the same definition of precoding similar to 176.9.1.2.

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

ACCEPT IN PRINCIPLE.

Background and proposed changes are provided on slides 4 to 10 in the following presentation:


Implement the proposed text on slides 8 and 9 of brown_3dj_02_2406.

Implement with editorial license.

**Comment 177 SC 177.5 P256 L13 # 582**

Ghiasi, Ali Ghiasi Quantum/Marvell

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

Pre-coding was shown on riani_3dj_01a_2303 FECI baseline that when was adopted, and pre-coding is essential for FECI PMDs

**Suggested Remedy**

Please insert text for pre-coder in this sub-clause. as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2. 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT. without OLT the optical transmitter should enable 1/(1+D) mod 4 precoding to mitigate burst error. See Ghiasi/Riani May-24 presentation on the need for pre-coder

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

ACCEPT IN PRINCIPLE.

Resolve using response to comment #547.

**Comment 177 SC 177.5.1 P256 L25 # 55**

Huber, Thomas Nokia

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

According to figure 177-2, the first process the receiver performs is PAM4 decoding (or soft-decision decoding).

**Suggested Remedy**

Add a subclause for the decoding process.

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

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #547.

**Comment 177 SC 177.5.1 P256 L24 # 55**

Huber, Thomas Nokia

**Comment Type T**  **Comment Status R**

This subclause is confusing and seems to be prescribing a specific implementation. The goal of the process is to find codeword boundaries and remove the pad. If we simply reverse the processes of the tx, this process would (in a logical sense) be performed on the interleaved stream, and would search for the (interleaved) FS pattern

**Suggested Remedy**

Rewrite the text to describe searching for the FS pattern and finding it at the expected interval

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

REJECT. The comment does not provide sufficient justification to support the suggested remedy. The existing text is consistent with the adopted baseline.
Slavick, Jeff
Broadcom

**Comment Type**: T
**Comment Status**: A
**Inner FEC Sync (bucket)

Monitor and drop says you monitor on all flows. But Figure 177-7 is a per flow state diagram. So is each Flow checking for 140 bad out of 150? And 150 is not a multiple of 8 for it to span across all flows evenly.

**Suggested Remedy**

Change:

"keeps monitoring 150 consecutive codewords on all flows, if at least 140 codewords are invalid, drop sync and restart from step a."

To:

"each flow counts the number of invalid codewords seen in consecutive non-overlapping 150 codeword windows, if at least 140 codewords are invalid, drop sync and restart from step a."

**Response Status**: C
**Response**: ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

---

Slavick, Jeff
Broadcom

**Comment Type**: T
**Comment Status**: A
**Inner FEC Sync (bucket)

A figure illustrating the possible one bit-pair of skew and the relationship to the Inner FEC flows would be very helpful here. I only understand because I recall the Task Force presentations!

**Suggested Remedy**

Consider adding a figure illustrating how the position of the 1 bit-pair of skew determines the Inner FEC flow number.

**Response Status**: C
**Response**: ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

---

Slavick, Jeff
Broadcom

**Comment Type**: T
**Comment Status**: A
**Inner FEC decode (bucket)

Defining how a miscorrected codeword can occur could be phrased more clearly.

**Suggested Remedy**

Change:

"Note that when there is more than one bit error in a codeword, there is a chance that the soft decision decoder could miscorrect the codeword."

**Response Status**: C
**Response**: ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.
In Figure 177-8, the input variable of state FS_LOCK_INIT is not correct. It would cause a FS lock error.

Propose change:
Change the input variable from ' !all_synced ' to ' all_synced * !fs_lock '.

Change the definition of all_synced from
'A Boolean variable that is set to true when sync_flow<x> is true for all eight flows and is set to false when sync_flow<x> is false for any x.' to
'A Boolean variable that is set to true when inner FEC flow 0 is identified and is set to false when sync_flow<x> is false for any x,'
(in page 258 line 48-50)

Response
ACCEPT IN PRINCIPLE.

Background and proposed changes are provided on slides 4 and 5 in the following presentation:

Implement the proposed changes shown on slide 5 of nicholl_3dj_01_2406, with editorial license.

In Figure 177-8, the wrong character is showing up for the <= symbol

SuggestedRemedy
Fix <= symbol in Figure 177-8

Response
ACCEPT IN PRINCIPLE.

Implementation with editorial license and discretion.
In order for the Inner FEC in combination with the SM-PMA above to interoperate with the already specified 200GBASE-R, 400GBASE-R, and 800GBASE-R PCS, the total skew introduced by the Inner FEC plus the SM-PMA above should be no higher than the BM-PMA defined for each rate. Furthermore, the skew should exclude the systematic skew that is added then removed by the 8:1 and 16:2 SM-PMA for 200G/400G.

Suggested Remedy
Specify the maximum skew for the combination of Inner FEC sublayer and the SM-PMA sublayer above it, excluding the systematic skew added then removed by the SM-PMA. A number needs to be determined.

Response Response Status Z
REJECT.

This comment was WITHDRAWN by the commenter.

Annex title unnecessarily uses the acronym IMDD. Not clear what purpose is achieved that cannot be achieved simply by omitting the use of the acronym IMDD.

Suggested Remedy
Delete the acronym IMDD.

Response Response Status C
ACCEPT IN PRINCIPLE.

The reference to 179.8.9 seems inappropriate here since that subclause contains cross-references specific to the Clause 179.

Suggested Remedy
Replicate the content of 179.8.9 here, replacing references to Clause 179 electrical requirements to the corresponding references in Clause 178.

Response Response Status C
ACCEPT IN PRINCIPLE.

The reference impedance should match the system impedance, \( R_d \) as defined in COM spreadsheets.

Suggested Remedy
92-ohm, TBD, or straw poll based on proposed values presented in Task Force contributions

Response Response Status C
REJECT.

The suggested remedy does not provide sufficient detail for the CRG to understand the requested changes, e.g., which specifications and measurements should use the proposed reference impedance.

There's no consensus to make changes. Further work and consensus building on this topic is encouraged.

Type: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
Comment Status: D/dispatched A/accepted R/rejected Response Status: O/open W/written C/closed Z/withdrawn
Sort Order: Clause, Subclause, page, line
The Bessel-Thomson filter should track fr. Between 0.5 fb and 0.6 fb have been shown in presentations.

Suggested Remedy
change TBD to 67GHz

Response
Response Status C
ACCEPT IN PRINCIPLE.

There are several comments on this topic. The editorial team prepared a proposal in slide 4 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01_2406.pdf.

Use 60 GHz for signal measurements in 178, 179, 176D, 176E. Replace all TBDs and the "40 GHz" that wasn't adopted.

Suggested Remedy
3dB BW is TBD

Response
Response Status C
ACCEPT IN PRINCIPLE.

Rational, considering the common and cost effective 1.85mm connector BW, and associated ~7% measurement error, give rise to this number.

Response
Response Status C
ACCEPT IN PRINCIPLE.

Resolve using the response to comment #29.

Suggested Remedy
Transmitter measurement bandwidth is TBD

Response
Response Status C
ACCEPT IN PRINCIPLE.

Resolve using the response to comment #60.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 178 SC 178.9.2 P276 L28 # 233
Li, Mike Intel
Comment Type TR Comment Status R TX FFE
"absolute value of step size for all taps (max)" ingreated from 802.3ck, value not suitable for 802.3dj at 200G/L, and no simod supports"

SuggestedRemedy
Change it 0.02, see See lim_3dj_01_2405
Response Response Status C REJECT.
The following presentation was reviewed by the task force at the May 2024 interim meeting: https://www.ieee802.org/3/dj/public/24_05/lim_3dj_01_2405.pdf

The comment and the presentation do not provide sufficient justification to support the suggested remedy.

The step sizes in the PMD Tx specifications do not need to match the COM parameters. They are based on reasonable implementation and measurement accuracy assumptions.


There is no consensus to make the suggested change.

Cl 178 SC 178.9.2 P276 L30 # 235
Li, Mike Intel
Comment Type TR Comment Status R TX FFE
"value at max state for c(û3) (min)" from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"

SuggestedRemedy
Change it to 0.16, see lim_3dj_01_2405
Response Response Status C REJECT.
Resolve using the response to comment #234

Cl 178 SC 178.9.2 P276 L31 # 238
Li, Mike Intel
Comment Type TR Comment Status R TX FFE
"value at min state for c(û2) (max)" from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"

SuggestedRemedy
change it to -0.4, see lim_3dj_01_2405
Response Response Status C REJECT.
Resolve using the response to comment #234

Cl 178 SC 178.9.2 P276 L34 # 27
Mellitz, Richard Samtec
Comment Type TR Comment Status A TX SNDR/SCMR
"value at min state for c(û1) (max)" from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"

SuggestedRemedy
change SNDR to 33.5 dB.
Response Response Status C ACCEPT IN PRINCIPLE.
Resolve using the response to comment #45.

Cl 178 SC 178.9.2 P276 L29 # 234
Li, Mike Intel
Comment Type TR Comment Status R TX FFE
"value at minimum state for c(û3) (max)" " from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"

SuggestedRemedy
C(3) is not needed, delete it, see lim_3dj_01_2405
Response Response Status C REJECT.
The following presentation was reviewed by the task force at the May 2024 interim meeting: https://www.ieee802.org/3/dj/public/24_05/lim_3dj_01_2405.pdf

The comment and the presentation do not provide sufficient justification to support the suggested remedy.

There is no consensus to implement the suggested remedy.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

Cl 178 SC 178.9.2 P276 L38 # 236
Li, Mike Intel

Comment Type TR Comment Status A
Output jitter (max) TBD

SuggestedRemedy
- replace TBDs with:
  - Jrms : 0.023 UI
  - J2.7u03 : 0.102 UI
  - J2.7u: 0.110 UI
- Even–odd jitter, pk-pk: 0.025 UI
- See lim_3dj_01_2403a, lim_3dj_01_2405, and [1], [2], [3]

Response
- ACCEPT IN PRINCIPLE.
- Resolve using the response to comment #204.

Cl 178 SC 178.9.2.1.2 P277 L37 # 28

Mellitz, Richard Samtec

Comment Type TR Comment Status A
scale ERL parameter form 0.3ck

SuggestedRemedy
- in table 178-7 change TBD's as follows
  - Tr 0.005 ns
  - \( \beta_x = 0 \)
  - \( \rho_x = 0.618 \)
  - N 400 UI
- See lim_3dj_01_2405, and [1], [2], [3]

Response
- ACCEPT IN PRINCIPLE.
- Resolve using the response to comment #204.

Cl 178 SC 178.9.2.2 P278 L26 # 29

Mellitz, Richard Samtec

Comment Type TR Comment Status A
scale ERL parameter form 0.3ck

SuggestedRemedy
- in table 163-7 change TBD's as follows
  - Tr 0.005 ns
  - \( \beta_x = 0 \)
  - \( \rho_x = 0.618 \)
  - N 400 UI
- See lim_3dj_01_2405, and [1], [2], [3]

Response
- ACCEPT IN PRINCIPLE.
- It is assumed based on the subclause/page/line, the suggested remedy seems to ask to change Table 178-8.
- The comment addresses an open TBD and the suggested remedy is reasonable.

There are several comments on this topic. The editorial team prepared a proposal in slide 5 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01_2406.pdf.

For the ERL tables in the following subclauses:
178.9.2.2, 178.9.2.1.2, 178.10.3, 179.9.4.8, 179.11.3, 179B.4.2
And the corresponding tables in annex 176D and annex 176E, use the following values:
- Tr = 0.005 ns
- \( \beta_x = 0 \)
- \( \rho_x = 0.618 \)
- N = 400 UI
- Additional, use the following values:
  - 178.9.2.2: N=400, min dERL=-3 dB
  - 178.9.2.1.2: N=400
  - 178.10.3: N=7000, min ERL=11 dB
  - 179.9.4.8: N=1600
  - 179B.4.2: N=1600, tw=1, DER0=2e-5

Cl 178 SC 178.9.2.2 P278 L26 # 29

Li, Mike Intel

Comment Type TR Comment Status A
Tr is TBD

SuggestedRemedy
- replace it with 0.005 ns, see lim_3dj_01_2403a

Response
- ACCEPT IN PRINCIPLE.
- Resolve using the response to comment #29.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
<th>Comment Status</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>178</td>
<td>178.9.2.2</td>
<td>278</td>
<td>27</td>
<td>TR</td>
<td>A</td>
<td>Betax is TBD</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>C</td>
<td>A</td>
<td>ERL</td>
</tr>
<tr>
<td>178</td>
<td>178.9.2.2</td>
<td>278</td>
<td>29</td>
<td>TR</td>
<td>A</td>
<td>Rox is TBD</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>C</td>
<td>A</td>
<td>ERL</td>
</tr>
<tr>
<td>178</td>
<td>178.9.2.2</td>
<td>278</td>
<td>31</td>
<td>TR</td>
<td>A</td>
<td>N is TBD</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>C</td>
<td>A</td>
<td>ERL</td>
</tr>
</tbody>
</table>

- **Comment Type**: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
- **Comment Status**: D/dispatched  A/accepted  R/rejected
- **Response Status**: O/open  W/written  C/closed  Z/withdrawn
- **Sort Order**: Clause, Subclause, page, line
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Comment Type TR Comment Status A
The baud rate has doubled from .3ck,. If loading is scaled down with the baud rate, the physical setting time would remain unchanged. Adjust Nv and Dp accordingly.
Suggested Remedy Change Nv=TBD to Nv=400
ACCEPT IN PRINCIPLE.

Comment Type TR Comment Status A
Use Np=400, Nv=400, and Dp=4 in clause 178, 179, Annex 176D and Annex 176E with editorial license.

Comment Type TR Comment Status A
3dB BW is TBD
Reject.
Resolve using the response to comment #60.

Comment Type TR Comment Status A
FEC symbol error ratio is not aligned with DER value
change it to 2e-3
ACCEPT IN PRINCIPLE.

Response Response Status C
Resolve using the response to comment #29.

Response Response Status C
Resolve using the response to comment #60.

Response Response Status C
Resolve using the response to comment #205.

Response Response Status C
Resolve using the response to comment #60.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

**Comment Type:** TR  **Comment Status:** A  **RX ITOL/JTOL**
**IL for Class A PKG are TBDs**

**SuggestedRemedy**
For Test 1, replace them with IL(min): 13.5 dB, ILmax: 14.5 dB; for Test 2, replace them with IL(min): 27.5 dB, ILmax: 28.5; see li_3dj_01_2311, lusted_3dj_02_2311.pdf

**Response**  
**Response Status:** C
**ACCEPT IN PRINCIPLE.**

Use the following values to replace TBDs in ILdd on Table 178–10:

- For test 2 (max loss)
  - For receiver package class A being (34 dB +/- 0.5 dB minus the ILdd of the specific package used in the test transmitter).
  - For receiver package class B being (30.5 dB +/- 0.5 dB minus the ILdd of the specific package used in the test transmitter).

- For test 1
  - One set of numbers for both package classes
    (15 dB +/- 0.5 dB minus the ILdd of the specific package used in the test transmitter).

Implement with editorial license.

---

**Comment Type:** TR  **Comment Status:** A  **RX ITOL/JTOL**
**IL for Class B PKG are TBDs**

**SuggestedRemedy**
For Test 1, replace them with IL(min): 10.5 dB, ILmax: 11.5 dB; for Test 2, replace them with IL(min): 21.5 dB, ILmax: 22.5; see li_3dj_01_2311, lusted_3dj_02_2311.pdf

**Response**  
**Response Status:** C
**ACCEPT IN PRINCIPLE.**

Resolve using the response to comment #247.

---

**Comment Type:** TR  **Comment Status:** A  **RX ITOL/JTOL**
**COM for test 1 and test 2 are TBDs**

**SuggestedRemedy**
Replace both with 3 dB, see lim_3dj_01_2405

**Response**  
**Response Status:** C
**ACCEPT IN PRINCIPLE.**

Resolve using the response to comment #250.

---

**Comment Type:** TR  **Comment Status:** A  **RX ITOL/JTOL (bucket)**
**COM values in Table 178.10 are TBD**

**SuggestedRemedy**
Replace TBD with 3 dB

**Response**  
**Response Status:** C
**ACCEPT IN PRINCIPLE.**

Resolve using the response to comment #250.

---

**Comment Type:** TR  **Comment Status:** A  **RX ITOL/JTOL (bucket)**
**The test channel COM, calculated per items 3) through 7) in 93C.2, is at least 3 dB**

**Response**  
**Response Status:** C
**ACCEPT IN PRINCIPLE.**

Implement the suggested remedy with editorial license.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Comment Type TR  Comment Status A
Comment Type TR  Comment Status A

Use 3 dB as minimum COM as in .3ck or change TBD to 3 (same in 178.10.1 line 28)

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Suggested Remedy

Replace the TBD with:
28 dB, Class A PKG pairs with Class A PKG
25 dB, Class A PKG pairs with Class B PKG
22 dB, Class B PKG pairs with Class B PKG

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.

Replace both with 3 dB, see lim_3dj_01_2405

Response Response Status C
RESOLVE USING THE RESPONSE TO COMMENT #250.
The reader may be tempted to interpret the parameters in Tables 178-12 and 178-13 as implementation requirements. E.g., “Receiver discrete-time equalizer parameters” may mistakenly be interpreted as requirements for receiver implementations. It would be worthwhile to add text here clarifying that the parameters represent a minimum level performance and that there is expected to be a variety of approaches to implementation that achieve this performance.

**SuggestedRemedy**

Add text stating the parameter values in the tables are chosen to represent the minimum required transmitter and receiver performance and they do not represent required implementation details. Compliant implementations are only required to meet or exceed this minimum level of performance. Similarly in 179.11.7 and 176.D.4.1.

**Response**

Response Status: C

ACCEPT IN PRINCIPLE.

Add the following note to 178.10.1:

"NOTE-The parameters and values in Table 178-12 and Table 178-13 correspond to behavioral models of transmitters and receivers that are compliant to the PMD specifications in this clause. The purpose of these parameters and values is to compute COM, a channel metric, and they do not represent requirements for transmitter and receiver implementations. It is expected that a variety of approaches to transmitter and receiver implementation will be able to meet the PMD specifications in this clause."

Add similar notes to 179.11.7, 176.D.4.1, and the new COM table in Annex 176E.

**Comment Type:** T

**Comment Status:** A

**COM methodology**

**SuggestedRemedy**

Replace it with 3 dB, see lim_3dj_01_2405

**Response**

Response Status: C

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #118.

**Comment Type:** TR/technical required

**Comment Status:** A

**COM pkg tau (bucket)**

COM reference package parameter vlaue. (transmission line parameter tau)

In “Table 178012” class A package model Transmission line parameter t(tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, liim_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.

**SuggestedRemedy**

Change t(tau) value in Table 178-12 (class A package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.

Or simply delete this row, as the t(tau) value in table 93A-3 is 6.141e-3 ns/mm.

**Response**

Response Status: C

ACCEPT IN PRINCIPLE.

The value in D1.0 is a typo.

Change 6.141e-4 to 6.141e-3 in Table 178-12, Table 179-15, and Table 176D-6 (twice in each table).
### IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P285</th>
<th>L28</th>
<th># 119</th>
</tr>
</thead>
<tbody>
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<td>Sakai, Toshiaki</td>
<td>Socionext</td>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td>COM pkg tau (bucket)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM reference package parameter value.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Table 178û12” class B package model Transmission line parameter t(τ) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, lifm_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.</td>
<td></td>
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</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change t(τ) value in Table 178-12 (class B package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.</td>
<td></td>
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</tr>
<tr>
<td>Or simply delete this row, as the t(τ) value in table 93A-3 is 6.141e-3 ns/mm.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td>Response Status</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accept IN PRINCIPLE.</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Resolve using the response to comment #118.</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
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<tbody>
<tr>
<td>Healey, Adam</td>
<td>Broadcom Inc.</td>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td>COM ref pkg (bucket)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>In Table 178-12, the transmission line parameters for the “Class B package model” do not match the adopted baseline proposal li_3dj_01a_2311 slide 9.</td>
<td></td>
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</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Replace the characteristic impedance for stage 1 with 92 Ohms, and the length/characteristic impedances for stage 2 through 4 with 70 Ohms/1 mm, 80 Ohm/1 mm, and 100 Ohm/0.5 mm respectively. Similarly in Table 179-15 and Table 176D-6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td>Response Status</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accept.</strong></td>
<td></td>
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<td></td>
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</tr>
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</table>

<table>
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<tr>
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<th>SC</th>
<th>P285</th>
<th>L38</th>
<th># 85</th>
</tr>
</thead>
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<tr>
<td>Mellitz, Richard</td>
<td>Samtec</td>
<td><strong>Comment Type</strong></td>
<td>TR</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td>R_0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-ended reference resistance R0 value in Table 178-13 is TBD</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace TBD with 50 Ohm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td>Response Status</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accept IN PRINCIPLE.</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>The proposed value of 50 Ohm is in agreement with the reference impedance used for deriving the package models adopted by motions #9 and #10 of November 2023 (see <a href="https://www.ieee802.org/3/dj/public/23_11/lusted_3dj_02_2311.pdf">https://www.ieee802.org/3/dj/public/23_11/lusted_3dj_02_2311.pdf</a>).</td>
<td></td>
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</tr>
<tr>
<td>Any other value would require recalculation of the model parameters in Table 178-12, Table 179-15, and Table 176D-6, and would therefore not be adequate.</td>
<td></td>
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</tr>
<tr>
<td>Change R_0 from TBD to 50 Ohm in Table 178-12, Table 179-17, Table 176D-6, and in the COM table in Annex 176E added by comment #72.</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CI</th>
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<th>P285</th>
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<tbody>
<tr>
<td>Mellitz, Richard</td>
<td>Samtec</td>
<td><strong>Comment Type</strong></td>
<td>TR</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td>R_0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Table 178û12): Computation can be independent of R0. Add a note to explain. S parameter can utilize any R0. For computation purposes s-parameters are converted to 50 ohms which is the native impedance for the most common test equipment.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change R0 for TBD to 50 ohms and add a note indicating the imported s-parameter are to be converted into 50 ohm reference before computation.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td>Response Status</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accept IN PRINCIPLE.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use the value in the response to comment #403.</td>
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</tr>
<tr>
<td>Add the requested note in all clauses and annexes that include the R0 parameter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implement with editorial license.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

**Comment Type** TR  
**Comment Status** A  
**Comment** Ro TBD  
**Suggested Remedy** 
Replaced it w 50 ohm, see see lim_3dj_01_2405, slide 5  
**Response** 
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #403.

---

**Comment Type** TR  
**Comment Status** A  
**Comment** RD(T) TBD  
**Suggested Remedy** 
Replaced it w 46.25 ohm, see see lim_3dj_01_2405, slide 5  
**Response** 
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #396.

---

**Comment Type** T  
**Comment Status** A  
**Comment** R_d = "TBD"  
**Suggested Remedy** 
Change "TBD" to "92-ohm" to match majority of contributions to the Task Force, and better align with Zc definition in package  
**Response** 
ACCEPT IN PRINCIPLE.  
There are several comments on this topic. The CRG reviewed the editorial team's notes on slide #8-10 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01c_2406.pdf.  
Following straw poll #E-2 (see below) there is consensus to make the following change. Change Rdt and Rdr in COM device parameters tables (Table 178-12, Table 179-15, Table 176D) from TBD to 46.25 Ohm. Implement with editorial license.  
For the record, there was consensus on having the reference impedance statements (178A.1.3, 178.9.1, 179.9.3, 179.11.1, and 176D.3.2) define a reference single-ended impedance of X Ohm for all frequency-domain specifications, e.g., insertion loss, return loss, and ERL, and adding a similar statement in 176E. The value of X was not decided. This response does not prescribe any changes in this regard.  
The following straw polls were taken:  
Straw poll #E-1 (direction)  
I would support changing Rdt and Rdr in COM device parameters tables (Table 178-12, Table 179-15, Table 176D) from TBD to X Ohm (same as the reference single-ended impedance of X Ohm for all frequency-domain specifications).  
Y: 12 N: 12 A: 8  
Straw poll #E-2 (direction)  
I would support changing Rdt and Rdr in COM device parameters tables (Table 178-12, Table 179-15, Table 176D) from TBD to 46.25 Ohm.  
Y: 18 N: 5 A: 9
**EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments**

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Page</th>
<th>Line</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>178</td>
<td>178.10.1</td>
<td>285</td>
<td>41</td>
<td>56</td>
</tr>
<tr>
<td>Li, Mike</td>
<td>Intel</td>
<td><strong>Comment Type</strong></td>
<td>TR</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td><strong>RD(R) TBD</strong></td>
<td></td>
<td></td>
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<td>178</td>
<td>SC 178.10.1</td>
<td>P285</td>
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<td>Intel</td>
<td><strong>Comment Type</strong></td>
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<td><strong>Suggested Remedy</strong></td>
<td></td>
<td><strong>rd TBD</strong></td>
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</tr>
<tr>
<td><strong>Kocsis, Sam</strong></td>
<td><strong>Amphenol</strong></td>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td><strong>RD(r) = &quot;TBD&quot;</strong></td>
<td></td>
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<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Change &quot;TBD&quot; to &quot;92-ohm&quot; to match majority of contributions to the Task Force, and better align with Zc definition in package</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td>C</td>
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<td>360</td>
<td>Cl</td>
<td>178</td>
<td>SC 178.10.1</td>
<td>P286</td>
</tr>
<tr>
<td>Healey, Adam</td>
<td>Broadcom Inc.</td>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td><strong>Parameters &quot;f_min&quot;, &quot;delta_f&quot;, and &quot;M&quot; are defined in Table 178-13 but are not used in Annex 178A. Any guidance on appropriate choices for measurement start frequency, frequency step, and simulation time step may be provided in a general way in Annex 178A (see, for example, 178A.1.3). The values for these parameters rarely, if ever, change and it seems unnecessary to add a row for them to an already lengthy table.</strong></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remove these parameters from Table 178-13. Also remove these parameters from Tables 179-16 and Table 176D-7.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td>C</td>
</tr>
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</table>

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

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

**SORT ORDER:** Clause, Subclause, page, line
The COM parameter values for the 200GBASE-KR1, 400GBASE-KR2, 800GBASE-KR4 and 1.6TBASE-KR8 PMDs are TBDs.

### Suggested Remedy

In table 178-13, use the COM parameter values from https://www.ieee802.org/3/dj/public/24_01/healey_3dj_01_2401.pdf slide 18, which are:

- $f_r = 0.58$
- $c(3) = 0$
- $c(2) = 0$
- $c(1) = 0$
- $c(0) = 1$
- $c(1) = 0$
- $A_v = 0.413$
- $A_{fe} = 0.413$
- $A_{ne} = 0.45$
- $\eta_0 = 6e^{-9}$
- $SNR_{TX} = 33$
- $\sigma_RJ = 0.01$
- $A_{DD} = 0.02$
- $R_{LM} = 0.95$
- $d_w = 5$
- $N_{fix} = 10$
- $N_{g} = 0$
- $N_{f} = 0$
- $N_{max} = 0$
- $b_{max}(1) = 0.85$
- $b_{min}(1) = 0$

Additionally, set MLSE = 0 (not enabled).
### IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

#### Comment Type TR

**Comment Status A**

**COM TxFFE**

The max/min values and step size of transmitter equalizer in Table 178-13 need to match those in the Table 178-6 and those in sub-clauses 179.9.4.1.4 & 179.9.4.1.5

**Suggested Remedy**

- On line 14 replace TBD with `-0.06:0.02:0`
- On line 18 replace TBD with `0:0.02:0.12`
- On line 22 replace TBD with `-0.34:0.02:0.2`
- On line 26 replace TBD with `0.5`
- On line 28 replace TBD with `-0.2:0.02:0`

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #37.

#### Comment Type TR

**Comment Status A**

**COM TxFFE**

C(-3) not needed

**Suggested Remedy**

Delete it, see see lim_3dj_01_2405, slide 5

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #37.

#### Comment Type TR

**Comment Status A**

**COM TxFFE**

C(-2) TBD

**Suggested Remedy**

Replace it w 0.0.16:0.02(min,max, step), see see lim_3dj_01_2405, slide 5

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #37.

---

**Comment Status** D/dispatched A/accepted R/rejected

**Response Status** O/open W/written C/closed Z/withdrawn

**SORT ORDER** Clause, Subclause, page, line

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

---

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6/13/2024 3:31:04 PM

---

Mellitz, Richard

**COM TxFFE**

- Presentations so far have not shown the need for Tx FFE. Change to no TXFFE until further data is provided.
- Rx noise may suggest a need for the TXFFE which would improve performance. It's not clear from a channel perspective that the TX FFE is not a zero sum gain compared to the Rx noise loss of COM. Until Rx FFE noise is better defined zero out Tx FFFE.

**Suggested Remedy**

- Change TBDs for c(-3),c(-2),c(-1), and c(1) to zero. Set C(0) tp 1.

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

There are several comments on this topic. The editorial team prepared a proposal in slide #11 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01c_2406.pdf.

The FFE coefficients in the transmitter characteristics may have larger ranges from those of the COM parameter table.

Use the following ranges and step sized for COM Tx FFE coefficients in 178, 179, 176D, and 176E.

- c(-3): 0 (not used in COM)
- c(-2): 0 to 0.14, in 0.02 steps
- c(-1): -0.34 to 0, in 0.02 steps
- c(0) minimum: 0.54
- c(+1): -0.2 to 0, in 0.02 steps.

Add editor's notes similar to that in slide 4 of https://www.ieee802.org/3/dj/public/24_05/lusted_3dj_07_2405.pdf to denote that the COM FFE ranges need further analysis.

---

Li, Mike

**Intel**

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #37.
## EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

<table>
<thead>
<tr>
<th>Cl 178</th>
<th>SC 178.10.1</th>
<th>P 286</th>
<th>L 26</th>
<th># 262</th>
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<tbody>
<tr>
<td>Cl 178</td>
<td>SC 178.10.1</td>
<td>P 286</td>
<td>L 26</td>
<td># 263</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 178</th>
<th>SC 178.10.1</th>
<th>P 286</th>
<th>L 26</th>
<th># 263</th>
</tr>
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<tbody>
<tr>
<td>Cl 178</td>
<td>SC 178.10.1</td>
<td>P 286</td>
<td>L 32</td>
<td># 264</td>
</tr>
</tbody>
</table>

| Cl 178 | SC 178.10.1 | P 286 | L 32 | # 264 |

| Cl 178 | SC 178.10.1 | P 286 | L 32 | # 264 |

| Cl 178 | SC 178.10.1 | P 286 | L 32 | # 264 |

**Li, Mike**  
Intel

**Comment Type**  
TR

**Comment Status**  
A

**Suggested Remedy**  
Replace it w -0.2.0.0.02 (min, max, step), see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

**Comment Type**  
TR

**Comment Status**  
A

**Suggested Remedy**  
Replace it w 0.54, see lim_3dj_01_2405, slide 5.

**Response**  
COM TxFFE

**Response Status**  
C

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -15 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -5 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -15 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -5 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

The following presentation was reviewed by the task force at the May 2024 interim meeting:  

The comment and the presentation do not provide sufficient justification to support the suggested remedy.

There are several comments on this topic. The editorial team prepared a proposal in slide 15 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01b_2406.pdf.

There was no consensus to make the suggested change.

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -15 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -5 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -15 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -5 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

There was no consensus to make the suggested change.

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -15 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -5 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -15 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -5 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -15 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -5 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -15 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

There was no consensus to make the suggested change.

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -15 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

**Comment Type**  
TR

**Comment Status**  
R

**Suggested Remedy**  
Replace them w -5 :0, 1 (min, max, step) see lim_3dj_01_2405, slide 5

**Response**  
COM TxFFE

**Response Status**  
C

---

There was no consensus to make the suggested change.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

**Comment Type**: TR
**Comment Status**: R
**Suggested Remedy**: Replace them with fb/4.223, fb/80 (fz1, fz2)
**Response**: REJECT.
Resolve using the response to comment #263.

**Comment Type**: TR
**Comment Status**: R
**Suggested Remedy**: Replace them with fb/1.8973, fb/2.6562, fb/80 (fp1, fp2, fp3)
**Response**: REJECT.
Resolve using the response to comment #263.

**Comment Type**: TR
**Comment Status**: R
**Suggested Remedy**: Replace Av with 0.413 V,
Replace Afe with 0.413 V,
Replace Ane with 0.608 V
**Response**: REJECT.
There is no consensus to implement the suggested remedy. Further contributions on this topic are encouraged.

**Comment Type**: TR
**Comment Status**: R
**Suggested Remedy**: Replace Av with 0.413 V
Replace Afe with 0.413 V
Replace Ane with 0.608 V
**Response**: REJECT.
Resolve using the response to comment #38.

**Comment Type**: TR
**Comment Status**: R
**Suggested Remedy**: Replace TBD with Tr = 4 ps
**Response**: ACCEPT IN PRINCIPLE.
Resolve using the response to comment #39.
<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>178</td>
<td>178.10.1</td>
<td>286</td>
<td>50</td>
<td>268</td>
</tr>
</tbody>
</table>

**Li, Mike**  
Intel

**Comment Type:** TR  
**Comment Status:** A  
COM T_r

**Suggested Remedy:**  
Replace it w 0.004 ns  
see lim_3dj_01_2405, slide 5

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.

Resolve using the response to comment #39.

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
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<tr>
<td>178</td>
<td>178.10.1</td>
<td>286</td>
<td>53</td>
<td>269</td>
</tr>
</tbody>
</table>

**Mellitz, Richard**  
Samtec

**Comment Type:** TR  
**Comment Status:** A  
COM T_r

scale Tr from 0.3ck. Understand that this is not the Tr at TP0d.

**Suggested Remedy:**  
set Tr to 0.00375 ns

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.

[Editor's note: Clause changed from 179.10.1]

There are several comments on this topic. The CRG reviewed the editorial team's notes on slide #16 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01c_2406.pdf.

Change T_r from TBD to 4 ps in Table 178-13, Table 179-15, Table 176D-7, and Table 176E-7.

Add editor's notes similar to that in slide 4 of  
https://www.ieee802.org/3/dj/public/24_05/lusted_3dj_07_2405.pdf to denote that this value needs further analysis.

<table>
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<th>#</th>
</tr>
</thead>
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<tr>
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<td>178.10.1</td>
<td>287</td>
<td>5</td>
<td>270</td>
</tr>
</tbody>
</table>

**Li, Tobey**  
MediaTek

**Comment Type:** TR  
**Comment Status:** R  
COM eta0

One sided noise spectral density in Table 178-13 is TBD

**Suggested Remedy:**  
Replace TBD with 6e-9 V^2/GHz

**Response**  
**Response Status:** C  
REJECT.

The following presentation was reviewed by the task force at the May 2024 interim meeting:  

The presentation is based on COM4.50draft3 using MLSE. The MLSE implementation within that code is however tentative and has not been fully debugged. Making a decision on the critical eta0 parameter is therefore premature.

The comment and the presentation do not provide sufficient justification to support the suggested remedy.

Although Straw Poll #7 in the May 2024 meeting showed consensus for the value 1e-8 for C2C and C2M, CR/KR were not addressed.

The values 5e-9 and 6e-9 are suggested in other comments.

Further analysis and consensus building are encouraged.

<table>
<thead>
<tr>
<th>CI</th>
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</tr>
</tbody>
</table>

**Li, Mike**  
Intel

**Comment Type:** TR  
**Comment Status:** A  
TX SNDR/SCMR

**Suggested Remedy:**  
Replace it w 33 dB  
see lim_3dj_01_2405, slide 5

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.

Resolve using the response to comment #45.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

### Comment #271

**Comment**

SigmaRJ TBD

**Suggested Remedy**

Replace it w 0.01 UI,

see lim_3dj_01_2405, slide 5

**Response**

Implement the suggested remedy and apply in addition in the COM tables in clause 179, annex 176D and Annex 176E.

### Comment #272

**Comment**

ADD TBD

**Suggested Remedy**

Replace it w 0.02 UI,

see lim_3dj_01_2405, slide 5

**Response**

Implement the suggested remedy and apply in addition in the COM tables in clause 179, annex 176D and Annex 176E.

### Comment #273

**Comment**

Replace it w 0.95,

see lim_3dj_01_2405, slide 5

**Suggested Remedy**

Replace it w 0.95

**Response**

Resolve using the response to comment #273.

---

**Comment**

Replace TBD with 0.95

**Response**

The following presentation was reviewed by the task force at the May 2024 interim meeting:


The comment and the presentation do not provide sufficient justification to support the suggested remedy.

There is no consensus to implement the suggested remedy. Further contributions on this topic are encouraged.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl 178 SC 178.10.1 P287 L13 # 274
Li, Mike Intel
Comment Type TR  Comment Status R
SuggestedRemedy dw TBD
Replace it w 6,
see lim_3dj_01_2405, slide 5
Response Response Status C
The following presentation was reviewed by the task force at the May 2024 interim meeting:
The comment and the presentation do not provide sufficient justification to support the
suggested remedy.
There is no consensus to implement the suggested remedy. Further contributions on this
topic are encouraged.

Cl 178 SC 178.10.1 P287 L16 # 277
Li, Mike Intel
Comment Type TR  Comment Status R
SuggestedRemedy NI TBD
Replace it w 5,
see lim_3dj_01_2405, slide 5
Response Response Status C
The following presentation was reviewed by the task force at the May 2024 interim meeting:
The comment and the presentation do not provide sufficient justification to support the
suggested remedy.
There is no consensus to implement the suggested remedy. Further contributions on this
topic are encouraged.

Cl 178 SC 178.10.1 P287 L15 # 276
Li, Mike Intel
Comment Type TR  Comment Status R
Ng TBD
SuggestedRemedy
Replace it w 4,
see lim_3dj_01_2405, slide 5
Response Response Status C
The following presentation was reviewed by the task force at the May 2024 interim meeting:
The comment and the presentation do not provide sufficient justification to support the
suggested remedy.
There is no consensus to implement the suggested remedy. Further contributions on this
topic are encouraged.

Cl 178 SC 178.10.1 P287 L17 # 278
Li, Mike Intel
Comment Type TR  Comment Status R
Namx TBD
SuggestedRemedy
Replace it w 60,
see lim_3dj_01_2405, slide 5
Response Response Status C
The following presentation was reviewed by the task force at the May 2024 interim meeting:
The comment and the presentation do not provide sufficient justification to support the
suggested remedy.
There is no consensus to implement the suggested remedy. Further contributions on this
topic are encouraged.
Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

---

**Comment Type: TR/technical required**

**Comment Status: A/accepted**

**Li, Mike**

**Intel**

**Comment:** TR  
**Comment Status:** A  
**Comment Type:** TR  
**Comment:** Replace it w 0.7. 
**Suggested Remedy:** Replace it w 0.7.  
**Response:** ACCEPT IN PRINCIPLE.  
**Response Status:** C  
**COM ref Rx:** Li, Mike  
**Intel**  
**Response:** 

---

**Comment Type: TR/technical required**

**Comment Status: A/accepted**

**Li, Mike**

**Intel**

**Comment:** TR  
**Comment Status:** A  
**Comment Type:** TR  
**Comment:** Replace it w 0.7. 
**Suggested Remedy:** Replace it w 0.7.  
**Response:** ACCEPT IN PRINCIPLE.  
**Response Status:** C  
**COM ref Rx:** Li, Mike  
**Intel**  
**Response:** 

---

**Comment Type: TR/technical required**

**Comment Status: A/accepted**

**Li, Mike**

**Intel**

**Comment:** TR  
**Comment Status:** A  
**Comment Type:** TR  
**Comment:** Replace it w 0.7. 
**Suggested Remedy:** Replace it w 0.7.  
**Response:** ACCEPT IN PRINCIPLE.  
**Response Status:** C  
**COM ref Rx:** Li, Mike  
**Intel**  
**Response:** 

---

**Comment Type: TR/technical required**

**Comment Status: A/accepted**

**Li, Mike**

**Intel**

**Comment:** TR  
**Comment Status:** A  
**Comment Type:** TR  
**Comment:** Replace it w 0.7. 
**Suggested Remedy:** Replace it w 0.7.  
**Response:** ACCEPT IN PRINCIPLE.  
**Response Status:** C  
**COM ref Rx:** Li, Mike  
**Intel**  
**Response:** 

---

**Comment Type: TR/technical required**

**Comment Status: A/accepted**

**Li, Mike**

**Intel**

**Comment:** TR  
**Comment Status:** A  
**Comment Type:** TR  
**Comment:** Replace it w 0.7. 
**Suggested Remedy:** Replace it w 0.7.  
**Response:** ACCEPT IN PRINCIPLE.  
**Response Status:** C  
**COM ref Rx:** Li, Mike  
**Intel**  
**Response:** 

---

**Comment Type: TR/technical required**

**Comment Status: A/accepted**

**Li, Mike**

**Intel**

**Comment:** TR  
**Comment Status:** A  
**Comment Type:** TR  
**Comment:** Replace it w 0.7. 
**Suggested Remedy:** Replace it w 0.7.  
**Response:** ACCEPT IN PRINCIPLE.  
**Response Status:** C  
**COM ref Rx:** Li, Mike  
**Intel**  
**Response:** 

---

**Comment Type: TR/technical required**

**Comment Status: A/accepted**

**Li, Mike**

**Intel**

**Comment:** TR  
**Comment Status:** A  
**Comment Type:** TR  
**Comment:** Replace it w 0.7. 
**Suggested Remedy:** Replace it w 0.7.  
**Response:** ACCEPT IN PRINCIPLE.  
**Response Status:** C  
**COM ref Rx:** Li, Mike  
**Intel**  
**Response:**
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Comment Type TR Comment Status A
Li, Mike Intel
Comment no floating tap coefficient min limit

SuggestedRemedy
Added a new line for floating tap coefficient min limit and set it to -0.05
see lim_3dj_01_2405, slide

Response Response Status C
accept in principle.
Implement the suggested remedy for the COM tables in clauses 178, clause 179, annex 176D and annex 176E, with editorial license.

(The value for the floating tap indexes overrides the value -0.7 for fixed tap indexes adopted by comment #279).

Comment Type TR Comment Status A
CL 178 SC 178.10.1 P287 L23 #284

Mellitz, Richard Samtec
Comment SNR_TX can be SNDR when loss correction is employed

SuggestedRemedy
Change TBD to 33.5 dB

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #45.

Comment Type TR Comment Status A
CL 178 SC 178.10.2 P287 L5 #81

Mellitz, Richard Samtec
Comment scale ERL parameter form 0.3ck

SuggestedRemedy
in table 178-14 change TBD's as follows
Tr 0.005 ns
0.3 x 0 GHz
7 x 0.618
N 7000 UI

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #29.

---

TYPE: TR/technical required ER/editorial required GR/general required T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Page 92 of 139  6/13/2024 3:31:05 PM
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

---

**Comment Type**: T  **Comment Status**: A  **Cl**: 178A-SC 178A.1.5  **P**: 650  **L**: 7  **#**: 228

**Noujeim, Leesa**  **Google**

**Comment**

The port labels on Figure 178A-6 are inconsistent with the cascade order implied in 178A-12 and with the text on line 1.

**Suggested Remedy**

In Fig 178A-6 replace "Port 2" with "Port 1" and replace "Port 1" with "Port 2"
Alternatively, replace Figure 178A-6 with a copy of Figure 178A-2 and reverse the arrow directions and swap Port 1 with Port 2.

**Response**

Accept in principle.

The comment correctly points out that port ordering conventions (1 is an input, 2 is an output) should be consistently applied.

In Figure 178A-6, label the input to the "Host channel (optional)" as "Port 1" and label the output of the "Device termination" as "Port 2".

Change the last sentence of 178A.1.5 to:
"The port order of the resulting model is then reversed so that port 1 becomes the input to the optional host channel (or the device package when the host channel is not included) and port 2 becomes the output of the device termination."

Implement with editorial license.

---

**Comment Type**: T  **Comment Status**: A  **Cl**: 178A-SC 178A.1.8  **P**: 654  **L**: 42  **#**: 209

**Shakiba, Hossein**  **Huawei Technologies Canada**

**Comment**

Reference to the wrong section 178A.1.6.4

**Suggested Remedy**

Change reference to section 178A.1.8.1

**Response**

Accept.

---

**Comment Type**: T  **Comment Status**: A  **Cl**: 178A-SC 178A.1.9  **P**: 657  **L**: 51  **#**: 210

**Shakiba, Hossein**  **Huawei Technologies Canada**

**Comment**

h-ISI in equation (178A-29) should not include the main cursor (h-ISI(main) = 0)

**Suggested Remedy**

Add a case to define h-ISI(n) = 0 for n = d+1

**Response**

Accept in principle.

Implement the suggested remedy with editorial license.

---

**Comment Type**: TR/technical required  **ER/editorial required**: G/general required  **T/technical**: E/editorial  **G/general**:

**Cl**: 178A-SC 178A.1.10  **P**: 658  **L**: 43  **#**: 362

**Healey, Adam**  **Broadcom Inc.**

**Comment**

The relationship between "detector error rate", "PAM-L symbol error rate", and "bit error ratio" is not documented and, as a result, not generally understood. While these quantities are related, they are not interchangeable. Prior assumptions that they are interchangeable have led to errors in the translation between COM results and expected (measured) receiver performance. This new annex gives us an opportunity to clarify the relationship between DER0 and other terms or to replace DER0 with a more generally understood term.

**Suggested Remedy**

Slide 5 of <https://www.ieee802.org/3/dj/public/23_11/healey_3dj_01a_2311.pdf> suggest expressions for relationship between detector error ratio and other terms. Either replace "DER0" with a target PAM-4 symbol error ratio (or bit error ratio) and adjust the equations for calculating COM accordingly, or document the relationship between DER0 and the other two terms.

**Response**

Accept in principle.

There are several comments on this topic. The editorial team prepared a proposal in slides 28-29 of https://www.ieee802.org/3/dj/public/24_05/ran_3dj_01b_2405.pdf.

Implement the changes on slide 29 of ran_3dj_01b_2406, with editorial license.

---

**Comment Type**: TR/technical required  **ER/editorial required**: A/accepted  **GR/general required**: D/dispatched  **T/technical**: W/written  **G/general**: C/closed  **Z/withdrawn**
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

**Comment Type:** T  
**Comment Status:** A  
**Suggested Remedy:**  
The factor 2/3 in equation (178A-36) is specific to PAM4. This change does not apply if the equation is rewritten. See contributions lim_3dj_02_2405.pdf and shakiba_3dj_01_2405.pdf.  
**Suggested Remedy:** Change 2/3 to L/2(L-1) to make it general. Note that L=4 still yields 2/3. Please refer to contribution tbd.  
**Response Type:** TR  
**Response Status:** C  
**ACCEPT IN PRINCIPLE.**  
The following contribution was reviewed at the May 2024 interim meeting:  
The modifications to Equations (178A-36) and (178A-37) are also influenced by the responses to comments #285 and #362.  
Resolve using the response to comment #362.

**Comment Status:** A  
**Response Status:** C  
**COM methodology MLSD_PAM**

**Li, Mike**  
**Intel**  
**Comment Type:** TR  
**Comment Status:** A  
**Suggested Remedy:** Update the equation per slide 4 of lim_3dj_02_2405, see also a marked version in the support data sheet.  
**Response Type:** TR  
**Response Status:** C  
**ACCEPT IN PRINCIPLE.**  
The following contributions were reviewed at the May 2024 interim meeting:  
The modifications to Equations (178A-36) and (178A-37) are also influenced by the responses to comments #285 and #362.  
Resolve using the response to comment #362.

**Comment Status:** A  
**Response Status:** C  
**COM methodology MLSD_PAM**

**Shakiba, Hossein**  
**Huawei Technologies Canada**  
**Response Type:** TR  
**Response Status:** C  
**ACCEPT IN PRINCIPLE.**  
The following contribution was reviewed at the May 2024 interim meeting:  
The modifications to Equations (178A-36) and (178A-37) are also influenced by the responses to comments #285 and #362.  
Resolve using the response to comment #362.

**Comment Status:** A  
**Response Status:** C  
**COM methodology MLSD_PAM**

**Li, Mike**  
**Intel**  
**Comment Type:** TR  
**Comment Status:** A  
**Suggested Remedy:** Update the equation per slide 4 of lim_3dj_02_2405, see also a marked version in the support data sheet.  
**Response Type:** TR  
**Response Status:** C  
**ACCEPT IN PRINCIPLE.**  
The following contributions were reviewed at the May 2024 interim meeting:  
The modifications to Equations (178A-36) and (178A-37) are also influenced by the responses to comments #285 and #362.  
Resolve using the response to comment #362.

**Comment Status:** A  
**Response Status:** C  
**COM methodology MLSD_PAM**

**Shakiba, Hossein**  
**Huawei Technologies Canada**  
**Response Type:** TR  
**Response Status:** C  
**ACCEPT IN PRINCIPLE.**  
The following contribution was reviewed at the May 2024 interim meeting:  
The modifications to Equations (178A-36) and (178A-37) are also influenced by the responses to comments #285 and #362.  
Resolve using the response to comment #362.

[Editor's note: changed subclause to 178A.1.11.]

**Comment Status:** A  
**Response Status:** C  
**COM methodology MLSD_PAM**

**Li, Mike**  
**Intel**  
**Comment Type:** TR  
**Comment Status:** A  
**Suggested Remedy:** Update the equation per slide 4 of lim_3dj_02_2405, see also a marked version in the support data sheet.  
**Response Type:** TR  
**Response Status:** C  
**ACCEPT IN PRINCIPLE.**  
The following contributions were reviewed at the May 2024 interim meeting:  
The modifications to Equations (178A-36) and (178A-37) are also influenced by the responses to comments #285 and #362.  
Resolve using the response to comment #362.

[Editor's note: changed subclause to 178A.1.11.]
Although clear, the result of the PDF convolution \( \text{conv}(p(y), p(y/b1)) \) is a PDF and assumed to have been normalized to satisfy the PDF sum requirement.

**Suggested Remedy**

Either mention that after convolution, the result should be normalized, or add a normalization coefficient of \( 1/b1 \) in front of \( \text{conv} \).

**Accept in Principle.**

On page 660, line 52, change "\( \text{conv}(p(y), p(y/b1)) \)" to "\( \text{conv}(p(y), p(y/(1-b1))) \)" where \( |a| \) is the absolute value of \( a \).

In Equation (178A-39), change "\( p(y/(1-b1)) \)" to "\( p(y/(1-b1))/|1-b1| \)."

Add a note that states that the operation \( p(y/a)/|a| \) scales random variable \( Y \) by a factor of \( a \), and that the scaled probability distribution function integrates to 1.

Implement with editorial license.

---

The reference impedance should match the system impedance, \( R_d \) as defined in COM spreadsheets.

**Suggested Remedy**

Either mention that after convolution, the result should be normalized, or add a normalization coefficient of \( 1/(1-b1) \) in font of \( \text{conv} \).

**Accept in Principle.**

Resolve using the response to comment #213.
Comment Type: T

Transmitter signal measurement filter bandwidth description.

"Unless specified otherwise, transmitter signal measurements are made for each lane separately using a fourth-order Bessel-Thomson low-pass response with 3 dB bandwidth of 40 GHz, with AC-coupled connection from TP2 to the test equipment."

The 4th-BW filter BW should be "TBD GHz", the same as for CL179.9.2, AN176D.3.3 and AN176E.3.3, as the Nyquist frequency of the signal is 53.125GHz and 40GHz is too low..

Suggested Remedy

Change 40GHz to TBD GHz.

Response

ACCEPT IN PRINCIPLE.

The value 40 GHz is a leftover from an older clause and has not been adopted.

Resolve using the response to comment #60.

---

Comment Type: TR

The baud rate has doubled from .3ck. If loading is scaled down with the baud rate, the physical setting time would remain unchanged. Adjust Np and Dp accordingly.

Suggested Remedy

Change Np from 200 to 400. change Dp from 4 to 8.

Response

ACCEPT IN PRINCIPLE.

Resolve using the response to #30.

---

Comment Type: TR

SNDR reduces with loss and used that way for equation 178Aû18.

Suggested Remedy

Insert a subsection e) Loss correction factor for fitted pulse measurements. See presentation

Response

ACCEPT IN PRINCIPLE.

There are several comments on this topic. The CRG reviewed the editorial team’s notes on slides 17-18 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01f_2406.pdf.

Change the definitions of SNDR in 179.9.4.6 and in 178.9.2.6 to use a numerator based on the suggested equations in slide 17 of ran_3dj_01f_2406.

Change SNDR (min) to 33.5 in transmitter characteristics in 178, 179, and 176D.

Change SNR TX in COM tables to 33.5.

Implement with editorial license.

There was no consensus to change the definition of SCMR as suggested in another comment.

---

Comment Type: T

scale Nv from .3ck

Suggested Remedy

change Nv to 400

Response

ACCEPT IN PRINCIPLE.

Resolve using the response to #30.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 179 SC 179.9.4.3 P314 L39 #226

Noujeim, Leesa Google

Comment Type T Comment Status A Tx SNR_ISI

Nb of 6 should be increased since hosts shouldn’t be penalized for having reflections within capability of receiver to compensate; hosts in this generation should have equalization capability well beyond 6 UI.

Suggested Remedy
increase Nb to 20 (or TBD based on ref receiver capabilities)

Response Response Status C
ACCEPT IN PRINCIPLE.

The comment is related to the number of UI after the pulse peak that should be excluded from calculations of SNR_ISI.

Implement the suggested remedy.
Add an editor’s note stating that the value of Nb needs confirmation.
Implement with editorial license.

Cl 179 SC 179.9.4.6 P315 L17 #37

Mellitz, Richard Samtec

Comment Type TR Comment Status A TX SNDR/SCMR

SNDR reduces with loss and used that way for equation 178A.018.

Suggested Remedy
change
The transmitter SNDR is defined by the measurement method described in 120D.3.1.6 to
The transmitter SNDR is defined by the measurement method described in 120D.3.1.6 plus a power loss factor defined in xxxx

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #45

Cl 179 SC 179.9.4.7 P310 L25 #204

Ran, Adee Cisco

Comment Type TR Comment Status A Tx jitter

Jitter specification is TBD.

Based on https://www.ieee802.org/3/dj/public/adhoc/electrical/24_0104/calvin_3dj_elec_01a_240104.pdf, the jitter measurement methodology of existing clauses 162, 163, and 120G (specifically using the two edges R03/F30) is feasible for measurements with a loss 30 dB.

It is expected that the same method can be used for higher losses as long as the scope can maintain CDR lock.

This methodology should be used for all electrical interfaces, with adequate adjustments.

Suggested Remedy
A detailed proposal will be provided.

Response Response Status C
ACCEPT IN PRINCIPLE.
The CRG reviewed the editorial team’s notes on slides 19-21 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01d_2406.pdf.

For the Transmitter output in Clause 178, Clause 179, and Annex 176D:
Use the jitter parameter Jrms03 (measured only on the R03 and F30 transitions).
With a maximum value of 0.023 UI.
Use the jitter parameter EOJ03 (measured only on the R03 and F30 transitions).
With a maximum value of 0.025 UI.

Use the jitter parameter J3u03 with maximum values of 0.106 UI for class A, 0.108 UI for class B for clause 178.
Use the jitter parameter J3u03 with maximum value of 0.115 UI for host-low, 0.122 for host-nom, 0.128 for host-high for clause 179.
Use the jitter parameter J4u03 with maximum value of 0.118 UI for class A, 0.120 UI for class B for annex 176D.

Add editor’s notes near each table, stating that the different values of J3u03/J4u03 are based on the assumption that the measured jitter is affected by the loss to the measurement point, and that further work related to this assumption is encouraged.

For Annex 176E:
Use the jitter parameter Jrms03 (measured only on the R03 and F30 transitions).
With a maximum value of 0.023 UI for both host output and module output.
Use the jitter parameter EOJ03 (measured only on the R03 and F30 transitions).
With a maximum value of 0.025 UI for both host output and module output.
Use the jitter parameter J4u03 with maximum values of 0.118 UI for Module output, 0.135 UI for Host output.

Add editor’s notes near each table, stating that the different values of J4u03 between host...
output and module output are based on the assumption that the measured jitter is affected by the loss to the measurement point, and not strongly affected by crosstalk in the connector, and that further work related to this assumption is encouraged.

Do not specify J6u03 at this time.

The following straw polls were taken:

Straw poll #E-3 (direction)
I would support using the same J3u03 limits for all CR transmitters regardless of the host class, and similarly the same limits for KR transmitter classes.
Y: 9 N: 10 A: 15

Straw poll #E-4 (decision)
I support using the JRMS03, EOJ03, and J4u03 for C2M host output and module output specifications.
Y: 13 N: 9 A: 12

---

There are several comments on this topic. The editorial team prepared a proposal in slide 6 of https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01a_2406.pdf.

Comments #227, #219 and #220 are about host ERL. In this case the existing specification of Tfx is suitable, although subtracting less than 0.2 ns may be appropriate in some cases. There was no consensus on how this should be specified.

Comments #218 and #221 are about module and cable assembly ERL. In this case the proposal may result in ambiguity in the definition of ERL. There was no consensus on making a change.

Additional study of this parameter and consensus building is encouraged.
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response Status</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>179</td>
<td>179.9.5.3.3</td>
<td>TR</td>
<td>A</td>
<td>4th order Bessel-Thomson filter BW is TBD</td>
<td>Replace TBD with 62 GHz</td>
<td>C</td>
<td>ACCEPT IN PRINCIPLE. Resolve using the response to comment #60.</td>
</tr>
<tr>
<td>179</td>
<td>179.9.5.4.2</td>
<td>TR</td>
<td>R</td>
<td>B-T filter BW</td>
<td>Case A - please amend to &lt;= 0.04, Case F, please amend to &gt;= 40</td>
<td>C</td>
<td>REJECT. The CRG reviewed the editorial team's notes on slide #25 of <a href="https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01f_2406.pdf">https://www.ieee802.org/3/dj/public/24_06/ran_3dj_01f_2406.pdf</a>. The comment does not provide sufficient justification to support the suggested remedy. There is no consensus to make the suggested changes.</td>
</tr>
<tr>
<td>179</td>
<td>179.11</td>
<td>T</td>
<td>A</td>
<td>The nominal characteristic impedance of the cable assembly is 100 ohms</td>
<td>Remove &quot;The nominal characteristic impedance of the cable assembly is 100 ohms&quot;</td>
<td>C</td>
<td>ACCEPT IN PRINCIPLE. It is important to define the reference impedance for return loss specifications etc., but as the comment correctly suggests, there is no need to specify a nominal value. Implement the suggested remedy.</td>
</tr>
</tbody>
</table>

**Additional Notes:***
- TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
- COMMENT STATUS: D/dispatched A/accepted R/rejected
- RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
- SORT ORDER: Clause, Subclause, page, line
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

Cl 179  SC 179.11.1  P326  L27  #389
Kocsis, Sam  Amphenol
Comment Type T  Comment Status A  Nominal impedance (bucket)
Nominal characteristic impedance of the cable assembly is "100-ohm"

SuggestedRemedy
Contributions to the task force have demonstrated the nominal characteristic impedance of the cable assembly is ~92-ohm

Response  Response Status C  ACCEPT IN PRINCIPLE.
It is understood that the suggested remedy is to change the nominal impedance from 100 to 92 Ohm.
However, as noted in comment #216, there is no need to specify a nominal impedance.
Resolve with using the response to comment #216.

Cl 179  SC 179.11.1  P326  L27  #516
Dawe, Piers  Nvidia
Comment Type T  Comment Status A  Nominal impedance (bucket)
"Nominal impedance" is something for a datasheet not a spec. If someone wants to build a cable assembly with 95 ohm bulk cable and it passes the spec - that's OK.

SuggestedRemedy
Delete "The nominal differential characteristic impedance of the cable assembly is 100 [ohm]". Move the one remaining sentence into 179.11.

Response  Response Status C  ACCEPT IN PRINCIPLE.
Resolve using the response to comment #216.

Cl 179  SC 179.11.2  P326  L42  #217
Noujem, Leesa  Google
Comment Type T  Comment Status A  B-T filter BW
The maximum frequency of 40GHz is is insufficient for 200Gbps/lane PAM4

SuggestedRemedy

Response  Response Status C  ACCEPT IN PRINCIPLE.
The value 40 GHz is a leftover from an older clause and has not been adopted.
Resolve using the response to comment #60.
### IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

<table>
<thead>
<tr>
<th>Cl 179</th>
<th>SC 179.11.7</th>
<th>P331</th>
<th>L18</th>
<th># 120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sakai, Toshiaki</td>
<td>Socionext</td>
<td>Comment Type T</td>
<td>Comment Status A</td>
<td>COM pkg tau (bucket)</td>
</tr>
<tr>
<td>COM reference package parameter value. (transmission line parameter tau)</td>
<td>In &quot;Table 179u15&quot; class A package model Transmission line parameter t(tau) value is 6.141×10^{-4} ns/mm, but based on the adopted motion#10, Nov/2024, (<a href="#">llim_3dj_01a_2311.pdf</a>) (page8-9), the value is 6.141×10^{-3}. The value should be 6.141×10^{-3} ns/mm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Change t(tau) value in Table 179-15 (class A package) from 6.141×10^{-4} ns/mm to 6.141×10^{-3} ns/mm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status C</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td>Resolving using the response to comment #118.</td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Cl 179</th>
<th>SC 179.11.7</th>
<th>P331</th>
<th>L28</th>
<th># 121</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sakai, Toshiaki</td>
<td>Socionext</td>
<td>Comment Type T</td>
<td>Comment Status A</td>
<td>COM pkg tau (bucket)</td>
</tr>
<tr>
<td>COM reference package parameter value. (transmission line parameter tau)</td>
<td>In &quot;Table 179u15&quot; class B package model Transmission line parameter t(tau) value is 6.141×10^{-4} ns/mm, but based on the adopted motion#10, Nov/2024, (<a href="#">llim_3dj_01a_2311.pdf</a>) (page8-9), the value is 6.141×10^{-3}. The value should be 6.141×10^{-3} ns/mm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Change t(tau) value in Table 179-15 (class B package) from 6.141×10^{-4} ns/mm to 6.141×10^{-3} ns/mm.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status C</strong></td>
<td></td>
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<tr>
<th>Cl 179</th>
<th>SC 179.11.7</th>
<th>P331</th>
<th>L42</th>
<th># 144</th>
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<tr>
<td>Li, Tobey</td>
<td>MediaTek</td>
<td>Comment Type T</td>
<td>Comment Status A</td>
<td>R$_0$</td>
</tr>
<tr>
<td>Single-ended reference resistance R0 value in Table 179u15 is TBD</td>
<td></td>
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<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Replace TBD with 50 Ohm</td>
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<td></td>
<td></td>
</tr>
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<td><strong>Response</strong></td>
<td><strong>Response Status C</strong></td>
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<th>SC 179.11.7</th>
<th>P331</th>
<th>L43</th>
<th># 152</th>
</tr>
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<tbody>
<tr>
<td>Mellitz, Richard</td>
<td>Samtec</td>
<td>Comment Type TR</td>
<td>Comment Status A</td>
<td>R$_0$</td>
</tr>
<tr>
<td>(Table 179u15): Computation can be independent of R0. Add a note to explain. S parameter can utilize any R0. For computation purposes s-parameters are converted to 50 ohms which is the native impedance for the most common test equipment.</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Change R0 for TBD to 50 ohms and add a note indicating the imported s-parameter are to be converted into 50 ohm reference before computation.</td>
<td></td>
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</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status C</strong></td>
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<tr>
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<th>P331</th>
<th>L44</th>
<th># 151</th>
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<tr>
<td>Kocsis, Sam</td>
<td>Amphenol</td>
<td>Comment Type T</td>
<td>Comment Status A</td>
<td>COM R$_d$</td>
</tr>
<tr>
<td>Rd(t) = &quot;TBD&quot;</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Change &quot;TBD&quot; to &quot;92-ohm&quot; to match majority of contributions to the Task Force, and better align with Zc definition in package</td>
<td></td>
<td></td>
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</tr>
<tr>
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<tr>
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<th>P331</th>
<th>L45</th>
<th># 152</th>
</tr>
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<tr>
<td>Kocsis, Sam</td>
<td>Amphenol</td>
<td>Comment Type T</td>
<td>Comment Status A</td>
<td>COM R$_d$</td>
</tr>
<tr>
<td>RD(r) = &quot;TBD&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Change &quot;TBD&quot; to &quot;92-ohm&quot; to match majority of contributions to the Task Force, and better align with Zc definition in package</td>
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<td>Resolving using the response to comment #396.</td>
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</tr>
</tbody>
</table>
### Comment #53

**Comment Type**: TR  **Comment Status**: A  **Commenter**: Mellitz, Richard  **Company**: Samtec

**Description**: Presentations so far have used fr of 0.5, 0.55, 0.58, and 0.6. 67 GHz limits on test equipment and cabling/connector modal physics suggest at least a 9 dB loss is required for good measurements at 67 GHz. Set fr to 0.6 or lower to achieve this.

**Suggested Remedy**: change TBD to 0.6.

**Response**

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

*ACCEPT IN PRINCIPLE.*

Resolve using the response to comment #36.

---

### Comment #36

**Comment Type**: TR  **Comment Status**: A  **Commenter**: Lusted, Kent  **Company**: Intel Corporation

**Description**: Receiver 3 dB bandwidth fr value in Table 179-16 is TBD

**Suggested Remedy**: Replace TBD with 0.58*fb

**Response**

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

*ACCEPT IN PRINCIPLE.*

Resolve using the response to comment #36.

---

### Comment #415

**Comment Type**: TR  **Comment Status**: A  **Commenter**: Li, Tobey  **Company**: MediaTek

**Description**: The COM parameter values for the 200GBASE-CR1, 400GBASE-CR2, 800GBASE-CR4 and 1.6TBASE-CR8 PMDs are TBDs

**Suggested Remedy**: In table 179-16, Use the COM parameter values from https://www.ieee802.org/3/dj/public/24_01/healey_3dj_01_2401.pdf slide 18, which are:

- $f_r = 0.58$
- $c(-3) = 0$
- $c(-2) = 0$
- $c(-1) = 0$
- $c(0) = 1$
- $c(1) = 0$
- $A_v = 0.413$
- $A_{fe} = 0.413$
- $A_{ne} = 0.45$
- $\eta_0 = 6e-9$
- $SNR_{TX} = 33$
- $\sigma_{RJ} = 0.01$
- $A_{DD} = 0.02$
- $R_{LM} = 0.95$
- $d_w = 5$
- $Nfix = 10$
- $N_g = 0$
- $N_f = 0$
- $N_{max} = 0$
- $b_{max}(1) = 0.85$
- $b_{min}(1) = 0$

Additionally, set $MLSE = 0$ (not enabled)

**Response**

**Response Status**: Z  **Response**

*REJECT.*

This comment was WITHDRAWN by the commenter.
### Comment 179 SC 179.11.7 P332 L13 #416

Li, Tobey  
MediaTek

**Comment Type**: TR  
**Comment Status**: A

**COM TxFFE**

The max/min values and step size of transmitter equalizer in Table 179-16 need to match those in the Table 17907 and those in sub-clauses 179.9.4.1.4 & 179.9.4.1.5

**SuggestedRemedy**
- On line 14 replace TBD with -0.06:0.02:0
- On line 18 replace TBD with 0:0.02:0.12
- On line 22 replace TBD with -0.34:0.02:0
- On line 26 replace TBD with 0.5
- On line 28 replace TBD with -0.2:0.02:0

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

Accept in principle.  
Resolve using the response to comment #37.

### Comment 179 SC 179.11.7 P332 L46 #417

Li, Tobey  
MediaTek

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

**COM voltage parameters**

Transmitter differential peak output voltage in Table 179016 is TBD

**SuggestedRemedy**
- Replace Av with 0.413 V  
- Replace Afe with 0.413 V  
- Replace Ane with 0.608 V

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

Reject.  
Resolve using the response to comment #38.

### Comment 179 SC 179.11.7 P332 L50 #418

Li, Tobey  
MediaTek

**Comment Type**: TR  
**Comment Status**: A

**COM T_r**

Transmitter transition time Tr value in Table 179016 is TBD

**SuggestedRemedy**
- Replace TBD with 0.95

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

Accept in principle.  
Resolve using the response to comment #273.

### Comment 179 SC 179.11.7 P333 L8 #420

Li, Tobey  
MediaTek

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

**COM eta0**

One sided noise spectral density in Table 179016 is TBD

**SuggestedRemedy**
- Replace TBD with 6e-9 V²/Hz

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

Reject.  
Resolve using the response to comment #269.

### Comment 179 SC 179.11.7 P333 L9 #421

Li, Tobey  
MediaTek

**Comment Type**: TR  
**Comment Status**: A

**COM methodology**

Level separation mismatch ratio RLM in Table 179016 is TBD

**SuggestedRemedy**
- Replace TBD with 0.95

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

Accept in principle.  
Resolve using the response to comment #273.

### Comment 179 SC 179.11.7 P333 L53 #419

Li, Tobey  
MediaTek

**Comment Type**: TR  
**Comment Status**: A

**COM T_r**

Number of samples per unit interval in Table 179016 is TBD

**SuggestedRemedy**
- Replace TBD with 32

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

Accept in principle.  
Resolve using the response to comment #360.
### Comment #54

**Comment Type:** TR  
**Comment Status:** R  
**Multiple COM parameters**  
Selecting values for the "Receiver discrete-time equalizer parameters" are critical for making progress. Many presentations have shown quite a variation. Select values based on what seems consistent or use straw ballot to determine.

**Suggested Remedy:**  
- Use straw polls from the following:  
  - Dw 4, 6, or 8  
  - Nfix 10, 15, 24  
  - Ng 1, 2, 3  
  - NF 3, 4, 5  
  - Nmax 40 60 120  
  - Wmax(j)=1  
  - Wmin(-1,0,1)=0; otherwise -0.5  
  - bmax(1) = 0, 0.5, 0.75, 0.85  
  - bmin(1)= -0.5, -0.75, -0.85

**Response**  
- Response Status: C  
- Reject, resolve using the response to comment #42.

---

### Comment #24

**Comment Type:** E  
**Comment Status:** A  
**Multiple COM parameters**  
Figure 179A-1 and figure 179A-2 are not showing completely in my PDF file.

**Suggested Remedy:**  
- Move the losses to the TP0d to TP2 column  
- Min host loss is the MCB loss of 2.8 dB  
- Max loss is dependent on actual package loss and should be removed

**Response**  
- Response Status: C  
- Reject.

---

### Comment #56

**Comment Type:** T  
**Comment Status:** A  
**Multiple COM parameters**  
Reference to a diagram with TP0d and TP5d is required.

**Suggested Remedy:**  
- Add TP0d and TP5d to figure 93B-1 and table 93B-1

**Response**  
- Response Status: C  
- Accept in principle.  
- Implement with editorial license and discretion.

---

### Comment #58

**Comment Type:** T  
**Comment Status:** R  
**Multiple COM parameters**  
Host designated losses of 6.5, 11.5, and 16.5 are for TP0d to TP2

**Suggested Remedy:**  
- Move the losses to the TP0d to TP2 column  
- Min host loss is the MCB loss of 2.8 dB  
- Max loss is dependent on actual package loss and should be removed

**Response**  
- Response Status: Z  
- Reject.

This comment was WITHDRAWN by the commenter.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Comment Type: T  Comment Status: R  Channel ILdd

Defining a "host channel" that includes most of the host but leaves out the connector, is not helpful. The connector is part of the host and its loss is significant.

Suggested Remedy

Define the recommended channel either from pad TP0d to the outside of the connector, or more usefully, from TP0d to TP2 (the loss from outside of the connector to TP2 is the HCB loss which will be well defined).

Response

REJECT.

What is defined is the recommended minimum and maximum differential insertion loss of the controlled impedance PCB, device package, and host connector footprints (looking into device independent of recepticle/plug). The connector IL is only defined in "mated state"; both plug and receptacle.

The host losses adopted are those of https://www.ieee802.org/3/dj/public/23_11/tracy_3dj_01a_2311.pdf, slide 12. This slide explicitly refers to "Device Package + Host PCB", which does not extend to TP2.

The suggested remedy does not include sufficient details to implement a change to the draft.

There is no consensus to make a change.

Comment Type: T  Comment Status: A  Channel ILdd (bucket)

Doubling ILdd (host+TFmax) implies both ends of the link have the same host designations.

Suggested Remedy

Replace "2*ILdd (host+TFmax)" with "ILdd (host+TFmax)_end1 + ILdd (host+TFmax)_end2" or similar notation to accommodate asymmetric Link Configurations in Table 179A-3.

Response

ACCEPT IN PRINCIPLE.

Implement with editorial license and discretion.

Comment Type: E  Comment Status: A  "TP0 and TP5"

"TP0 and TP5"

Suggested Remedy

Change to "TP0d and TP5d"

Response

ACCEPT IN PRINCIPLE.

Implement with editorial license and discretion.
Cl 179A  SC 179A.7  P668  L9  # 215
Noujeim, Leesa  Google

Comment Type  T  Comment Status  A

TP0 and TP5 are not the appropriate test points for Annex 179A COM

SuggestedRemedy
Change text to ".. between TP0d and TP5d"

Response  Response Status  C
ACCEPT IN PRINCIPLE.

The procedure in Annex 179A and the parameters in Table 178-13 add reference package and device models to both sides of the channel from TP0 to TP5.

If the recommendation here is to calculate COM for the channel from TP0d to TP5d, which includes the packages, then no package models need to be concatenated.

Implement the suggested remedy with the addition of an exception that in calculation of COM, only the device models are concatenated to the TP0d-TP5d channel (i.e., package models are excluded).

Indicate the locations of the test points in the diagrams in Annex 178A and elsewhere, as appropriate.
Implement with editorial license.

Cl 179A  SC 179A.7  P668  L12  # 57
Mellitz, Richard  Samtec

Comment Type  TR  Comment Status  A

The COM values need to be set to make progress. Until a more comprehensive proposal is presented use what is in 0.3ck and many other prior standards

SuggestedRemedy
set COM to 3 dB

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Resolve using the response to comment #250.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

**Cl 179B SC 179B.1 P669 L17 # 223**

Noujeim, Leesa Google

**Comment Type T**  Comment Status A  HCB and MCB (bucket)

Missing reference to Module compliance at TP1 and TP4

**Suggested Remedy**

Add "Module measurements for Modules specified in Annex 176E are made at TP1 and TP4 with test fixtures as specified in 179B.3."

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

Insert the sentence:

Module measurements for modules specified in Annex 176E are made at module compliance points TP1 and TP4 (see Figure 176E-4) with test fixtures as specified in 179B.3.

---

**Cl 179B SC 179B.4.2 P673 L13 # 58**

Mellitz, Richard Samtec

**Comment Type TR**  Comment Status A  ERL

scale ERL parameter form 0.3ck

**Suggested Remedy**

in table 178-14 change TBD's as follows

Tr 0.005 ns

Tx 0.618

N 1600 UI

Tfx 0

tw 1

dero 2e-5

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

It is assumed that, based on the subclause/page/line, the suggested remedy is asking to change Table 179B-1.

Resolve using the response to comment #29.

---

**Cl 179B SC 179B.4.6 P676 L26 # 224**

Noujeim, Leesa Google

**Comment Type T**  Comment Status A  HCB and MCB (bucket)

SFPxxx is unclear

**Suggested Remedy**

Replace "The SFPxxx mated test fixture" with "The single-lane mated test fixture"

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

In 179B replace SFPxxx with SFP112

---

**Cl 179B SC 179B.4.26 P676 L41 # 58**

Mellitz, Richard Samtec

**Comment Type TR**  Comment Status A  HCB and MCB (bucket)

At least the symbol rate is known

**Suggested Remedy**

set fb to 106.25 GBd

**Response**

**Response Status C**

ACCEPT.

---

**Cl 179C SC 179C.1 P680 L15 # 525**

Dawe, Piers Nvidia

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

MDIs are mechanical entities. For 106.25 GBd operation, there are SFP2 (SFF-TA-1031) and QSFP2 (SFF-TA-1027). Any "SFP224" would be an SFP2 module or cable end with 200G-capable circuitry. But this annex is for the MDI, not the circuitry. Similarly for "QSFP224" and QSFP2.

**Suggested Remedy**

Correct the names. Add references to SFF-TA-1011 which relates the names and specs for the SNIA-SFF modules, and SFF-8665, which defines the components of a QSFPx "solution".

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

There was broad consensus to use names of MDI types (part of baseline proposal) currently in the draft as follows: SFP224, SFP-DD224,QSFP224, QSFP-DD1600, QSFP1600.

Resolve using the response to comment #506, which addresses the normative references.

---
<table>
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<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
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<tr>
<td>179C</td>
<td>179C.1</td>
<td>TR</td>
<td>A</td>
<td>Refer to the specification for each connector type where each is first mentioned. See another comment against 1.3 for the reference docs</td>
<td>Per comment</td>
<td>C</td>
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<td>179C</td>
<td>179C.1</td>
<td>E</td>
<td>A</td>
<td>&quot;QSFP-DD800&quot;</td>
<td>Change to &quot;QSFP-DD1600&quot;</td>
<td>C</td>
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<tr>
<td>179C</td>
<td>179C.2.3</td>
<td>T</td>
<td>A</td>
<td>This says “the mechanical interface”. The mechanical spec is SFF-TA-1027, QSFP2. It is a standard, not an MSA.</td>
<td>Change &quot;the TBD MSA&quot; to &quot;SFF-TA-1027&quot;.</td>
<td>C</td>
<td></td>
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<tr>
<td>180</td>
<td>180.4</td>
<td>T</td>
<td>A</td>
<td>Prior to 180.4 add section for PMA function to support precoder to mitigate burst errors</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>C</td>
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**Suggested Remedy**

- **TR/technical required**
- **ER/editorial required**
- **GR/general required**
- **T/technical**
- **E/editorial**
- **G/general**

**COMMENT STATUS**

- **D/dispatched**
- **A/accepted**
- **R/rejected**

**RESPONSE STATUS**

- **O/open**
- **W/written**
- **C/closed**
- **Z/withdrawn**

**SORT ORDER**

- **Clause, Subclause, page, line**

---

**IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments**

- **Dawe, Piers**
  - **Nvidia**
- **Kocsis, Sam**
  - **Amphenol**
- **Ghiasi, Ali**
  - **Ghiasi Quantum/Marvell**
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

<table>
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<th>Cl 180</th>
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<th>P350</th>
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<th># 160</th>
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<td>Yu, Rang-chen</td>
<td>InnoLight</td>
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<td>Comment Type ER</td>
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<td>A typo of 'L3' in figure 180-2, right side, 3rd channel output label.</td>
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</tbody>
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**SuggestedRemedy**

It should be 'L2'.

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement with editorial license and discretion.

<table>
<thead>
<tr>
<th>Cl 180</th>
<th>SC 180.6.1</th>
<th>P353</th>
<th>L33</th>
<th># 326</th>
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<td>Welch, Brian</td>
<td>Cisco</td>
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<tr>
<td>Comment Type TR</td>
<td>Comment Status A</td>
<td>TX specs</td>
<td></td>
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</tr>
<tr>
<td>In later 100GPL specs (ie, 100GBASE-FR1) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.5 dB as it was not updated to reflect the changes to effective TDECQ(min).</td>
<td></td>
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</table>

**SuggestedRemedy**

Propose changing "Average launch power, each lane (min)" in Table 180-7 from -2.8 dBm to -3.3 dBm.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change "Average launch power, each lane (min)" in Table 180-7 from -2.8 dBm to -3.3 dBm.

In Table 180-7, add a footnote to the value "-3.3" on the row for "Average launch power, each lane (min)" with the following text:

"Average launch power of -3.3 dBm corresponds to an OMA of -0.3 dBm with an infinite extinction ratio."

Implement with editorial license.

<table>
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<th>SC 180.6.2</th>
<th>P354</th>
<th>L35</th>
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<td>Dawe, Piers</td>
<td>Nvidia</td>
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<tr>
<td>Comment Type T</td>
<td>Comment Status A</td>
<td>RX specs</td>
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<tr>
<td>In 802.3db we acknowledged that single-lane PMDs are often packaged in multilane modules, and subject to much the same crosstalk as multilane PMDs.</td>
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**SuggestedRemedy**

Delete footnote e, "No aggressors needed for 200GBASE-DR1." In 180.8.13 Stressed receiver sensitivity, add "For a receiver in a multilane device, the OMA outer of the aggressor lanes is specified in Table 180-8."

Response Response Status C

ACCEPT IN PRINCIPLE.

Change footnote e, to "No aggressors needed for 200GBASE-DR1 in a single lane device."

With editorial license.

<table>
<thead>
<tr>
<th>Cl 180</th>
<th>SC 180.6.3</th>
<th>P356</th>
<th>L47</th>
<th># 127</th>
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<td>Johnson, John</td>
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<td>power budget</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The power budget does not explicitly say what the penalty allocation is for MPI and DGD. It's implied by the difference between Allocation for penalties (for max TDECQ) and TDECQ(max). This makes it hard for average readers to understand the power budget.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SuggestedRemedy**

Add to Table 180-9, footnote (b), "This value includes an allocation of 0.1 dB for MPI and DGD penalties."

Response Response Status C

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

<table>
<thead>
<tr>
<th>Cl 180</th>
<th>SC 180.6.3</th>
<th>P356</th>
<th>L47</th>
<th># 170</th>
</tr>
</thead>
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<tr>
<td>Yu, Rang-chen</td>
<td>InnoLight</td>
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<tr>
<td>Comment Type T</td>
<td>Comment Status A</td>
<td>power budget</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Footnote b did not clarify what's the composition of total 3.5dB allocation for penalties.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SuggestedRemedy**

Recommend to add "Allocations to penalties for DRx series including penalties due to dispersion 3.4dB, DGD and MPI 0.1dB" to footnote b.

Response Response Status C

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #127.
### IEC 61753-1-1 has been superseded by IEC 61753-1.

**Suggested Remedy**

Change "IEC 61753-1-1" to "IEC 61753-1" in the PMD clause.

**Response**

ACCEPT IN PRINCIPLE.

Add "IEC 61753-1, Fibre optic interconnecting devices and passive components - Performance standard - Part 1: General and guidance" to 1.3 Normative references.

With editorial license.
The current method for optimizing the tap weighs of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: ÔThe lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration.Ó Note that the MMSE optimization method is used in almost all TDECQ measurements performed today.

Suggested Remedy
Add the following text at line 36 (end of exceptions list):

The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration.

Response
ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

1. **180.8.5**
   - **Comment Type**: T
   - **Comment Status**: A
   - **TDECQ**
   - **Suggested Remedy**
     - Add a new exception to the list in 180.8.5:
     - "The optical return loss is as given in Table 180-6.*

   **Response**
   - Response Status: C
   - **ACCEPT IN PRINCIPLE.**
   - Add a new exception to the list in 180.8.5:
     - "The optical return loss is as given in Table 180-7.*

   **Implement with editorial license.**

2. **180.8.11**
   - **Comment Type**: TR
   - **Comment Status**: A
   - **TDECQ**
   - **Suggested Remedy**
     - Propose adopting the TDECQ tap weight restrictions as presented in welch_3dj_01_0524.

   **Response**
   - Response Status: C
   - **ACCEPT IN PRINCIPLE.**

   **The following presentation was reviewed by the 802.3dj task force at the May Interim meeting:**

   **Implement slides 8 and 9 of the presentation with editorial license.**

3. **180.8.11**
   - **Comment Type**: T
   - **Comment Status**: A
   - **RIN-OMA**
   - **Suggested Remedy**
     - Change the bandwidth for RIN measurement to be the same as the TDECQ receiver's BT4 filter (50% of signalling rate ~ 53.1 GHz) or 75%, or something in between.

   **Response**
   - Response Status: C
   - **ACCEPT IN PRINCIPLE.**

   **The following presentation was reviewed by the 802.3dj task force at the May Interim meeting:**

   **Implement slides 8 and 9 of the presentation with editorial license.**

4. **180.8.11**
   - **Comment Type**: T
   - **Comment Status**: A
   - **RIN-OMA**
   - **Suggested Remedy**
     - The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52)

   **Response**
   - Response Status: C
   - **ACCEPT IN PRINCIPLE.**

   **Resolve using the response to comment #518**

---

**TYPE**: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general  
**COMMENT STATUS**: D/dispatched  A/accepted  R/rejected  
**RESPONSE STATUS**: O/open  W/written  C/closed  Z/withdrawn  
**SORT ORDER**: Clause, Subclause, page, line  

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**Page 112 of 139**  
6/13/2024 3:31:05 PM
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 180 SC 180.8.13 P366 L25 # 519
Dawe, Piers Nvidia
Comment Type T Comment Status R Jitter (common)
More exceptions - I found these in 167.8.14

Suggested Remedy
The applied sinusoidal jitter is specified in 180.8.13.1.
The values of overshoot/undershoot and transmitter power excursion of the stressed receiver conformance signal are within the limits specified in Table 180-7.
For a receiver in a multilane device, the OMA outer of the aggressor lanes is specified in Table 180-8.

Add a sinusoidal jitter section following 167.8.14.1 (but see next comment).

Response Response Status C
REJECT.
The comment does not provide sufficient justification to support the suggested remedy.

Cl 180 SC 180.8.13 P366 L26 # 520
Dawe, Piers Nvidia
Comment Type T Comment Status R Jitter (common)
If the rising LF jitter slope for 113.4375 GBd is based on 4 MHz, 0.05 UI pk-pk, the LF jitter slope for 106.25 GBd must match in absolute time units (not UI) so that there is not an unbounded buffering requirement (or one jitter slope can be modified in shape).

Suggested Remedy
In the FECi clauses, instead of 2e5/f, 0.05 UI, use 2.13e5/f, 0.053 UI. Or, here and in the other non-FECi PMD and PMA clauses, use 1.875e5/f, 0.047 UI.

Response Response Status C
REJECT.
The justification provided by the comment is not sufficient to make the proposed changes. A detailed presentation providing better justification is encouraged.

Cl 180 SC 180.9.1 P366 L31 # 542
Lambert, Angie Corning
Comment Type T Comment Status A IEC revision
IEC 60950-1 has been superseded by IEC 62368-1.

Suggested Remedy
Change "IEC 60950-1" to "IEC 62368-1".

Response Response Status C
ACCEPT IN PRINCIPLE.

Change "IEC 60950-1" to "IEC 62368-1" in the PMD clause.

Cl 180 SC 180.10 P368 L11 # 521
Dawe, Piers Nvidia
Comment Type T Comment Status A bit number (bucket)
Bit number should match number of lanes

Suggested Remedy
Change 1.9.4 to 1.9.n. Below, change 1.10.4 to 1.10.n. Similarly in other clauses.

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl 181 SC 181.1 P372 L16 # 4
Johnson, John Broadcom
Comment Type T Comment Status A Editorial (bucket)
The PHY bracket in Figure 181-1 is shown encompassing the MDI layer, which isn't consistent with previous PMDs.

Suggested Remedy
Shorten the PHY bracket to exclude the MDI layer.

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.
### IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

<table>
<thead>
<tr>
<th>Cl 181</th>
<th>SC 181.4</th>
<th>P373</th>
<th>L33</th>
<th># 145</th>
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</thead>
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<tr>
<td>Ghiasi, Ali</td>
<td>Ghiasi Quantum/Marvell</td>
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</tr>
</tbody>
</table>

**Comment Type**: T  **Comment Status**: A  **Precoding**

Prior to 181.4 add section for PMA function to support precoder to mitigate burst errors

**Suggested Remedy**

The transmitter needs to support 1/(1+D) mod 4 precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2.6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable 1/(1+D) mod 4 precoding to mitigate burst error.

**Response**

**Response Status**: C

**ACCEPT IN PRINCIPLE.**

Resolve using the response to comment #21

---

<table>
<thead>
<tr>
<th>Cl 181</th>
<th>SC 181.6.1</th>
<th>P378</th>
<th>L13</th>
<th># 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johnson, John</td>
<td>Broadcom</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Comment Type**: T  **Comment Status**: A  **TX specs**

Total average launch power (max) in Table 181-5 is TBD for 800GBASE-FR4-500.

**Suggested Remedy**

Replace TBD with a value equal to the Average launch power, each lane (max) + 6 dB, which is 4.9 + 6 = 10.9 dB. This methodology is consistent with previous FR4 PMDs (clauses 122, 151).

**Response**

**Response Status**: C

**ACCEPT IN PRINCIPLE.**

Implement the suggested remedy with editorial license.

---

<table>
<thead>
<tr>
<th>Cl 181</th>
<th>SC 181.6.1</th>
<th>P378</th>
<th>L16</th>
<th># 162</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yu, Rang-chen</td>
<td>InnoLight</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment Type**: TR  **Comment Status**: A  **TX specs**

recommend relationship between 'Tx_OMAout (min)' and 'Tx_Pavg (min)' (in Table 18105) follow 400G FR4, with delta=3dB, assuming max. OER infinite.

**Suggested Remedy**

With 'OMAout (min)='0.8dBm, then 'Average launch power, each lane (min)' in Table 181-5 should be changed to -2.2dBm.

**Response**

**Response Status**: C

**ACCEPT IN PRINCIPLE.**

In Table 181-5 change "Average launch power, each lane (min)" from -1.8 to -2.2

In Table 181-5, add a footnote to the value "+2.2" on the row for "Average launch power, each lane (min)" with the following text:

"Average launch power of -2.2 dBm corresponds to an OMA of 0.8 dBm with an infinite extinction ratio."

With editorial license.

---

<table>
<thead>
<tr>
<th>Cl 181</th>
<th>SC 181.6.1</th>
<th>P378</th>
<th>L16</th>
<th># 327</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welch, Brian</td>
<td>Cisco</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Comment Type**: TR  **Comment Status**: A  **TX specs**

In later 100GPL specs (ie, 400GBASE-FR4) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.6 dB as it was not updated to reflect the changes to effective TDECQ(min).

**Suggested Remedy**

Propose changing "Average launch power, each lane (min)" in Table 181-5 from -1.8 dBm to -2.2 dBm.

**Response**

**Response Status**: C

**ACCEPT IN PRINCIPLE.**

Resolve using the response to comment #162
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

**Comment Type**: TR/technical required  **ER/editorial required  **GR/general required  **T/technical  **E/editorial  **G/general

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

**SORT ORDER**: Clause, Subclause, page, line

---

Comment 181 SC 181 6.1

**Comment Type**: T  **Comment Status**: A  **TX specs**

Difference in launch power between any two lanes (OMAouter) (max) in Table 181-5 is TBD for 800GBASE-FR4-500.

**Suggested Remedy**

Replace TBD with a value of OMAouter(max) minus OMAouter(min) or 4 dB, whichever is smaller.

**Response**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

---

Comment 181 SC 181 6.2

**Comment Type**: TR  **Comment Status**: A  **RX specs**

The delta between 'Tx_Pavg(min)' and 'Rx_Pavg(min)' should equal to 'Channel insertion loss' (3.5dB for FR4-500).

**Suggested Remedy**

Rx_Pavg (min)' in Table 181-6 should be -2.2dBm-3.5dB=-5.7dBm

**Response**

ACCEPT IN PRINCIPLE.

In Table 181-6, change the value for "Average receive power, each lane (min)" to -5.7.

---

Comment 181 SC 181 6.3

**Comment Type**: T  **Comment Status**: A  **Power budget**

Power budget (for maximum TDECQ)' for 800GBASE-FR4-500 in Table 181-7 could be incorrect. It should be equal to channel IL + allocation for penalties (for maximum TDECQ).

**Suggested Remedy**

Power budget (for maximum TDECQ)' in Table 181-7 should be updated to 7.4 dB

**Response**

ACCEPT.

---

Comment 181 SC 181 6.3

**Comment Type**: T  **Comment Status**: A  **Power budget**

The power budget does not explicitly say what the penalty allocation is for MPI and DGD. It's implied by the difference between Allocation for penalties (for max TDECQ) and TDECQ(max). This makes it hard for average readers to understand the power budget.

**Suggested Remedy**

Add to Table 181-7, footnote (d), "This value includes an allocation of 0.5 dB for MPI and DGD penalties."

**Response**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #128

---

Comment 181 SC 181 6.3

**Comment Type**: T  **Comment Status**: A  **Power budget**

Difference in receive power between any two lanes (OMAouter) (max) in Table 181-6 is TBD for 800GBASE-FR4-500.

**Suggested Remedy**

Replace TBD with a value of 4.1 dB, consistent with other FR4 PMDs (Cl. 122, 151)

**Response**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

---

Comment 181 SC 181 6.3

**Comment Type**: T  **Comment Status**: A  **Power budget**

The power budget does not explicitly say what the penalty allocation is for MPI and DGD. It's implied by the difference between Allocation for penalties (for max TDECQ) and TDECQ(max). This makes it hard for average readers to understand the power budget.

**Suggested Remedy**

Add to Table 181-7, footnote (d), "This value includes an allocation of 0.5 dB for MPI and DGD penalties."

**Response**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Cl 181 SC 181.7 P383 L 16 # 173
Yu, Rang-chen InnoLight

Comment Type T Comment Status A power budget
DGDmax (in Table 181.8) probably used DGDmean=0.8ps, it should be 2.24ps refer to 802.3df DR series.

SuggestedRemedy
Recommend change to 2.24ps

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement proposed remedy with editorial license.

Cl 181 SC 181.7.1 P383 L 26 # 336
Ferretti, Vince Corning

Comment Type TR Comment Status A optical channel specs
ITU-T G.652.B cabled fiber attenuation is only specified for 1310 nm and 1550 nm wavelengths. It is not specified for wavelengths between 1260 nm and 1310 nm and not meant to be used in xWDM applications.

SuggestedRemedy
Remove ITU-T G.652.B (dispersion unshifted) as a fiber option.

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement suggested remedy.
Implement the same change in clause 181.7.1.
With editorial license

Cl 181 SC 181.7.3 P384 L 43 # 343
Lambert, Angie Corning

Comment Type T Comment Status A IEC revision
IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy
Change "IEC 61753-021-2" to "IEC 61753-021-02".

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #339.

Cl 181 SC 181.8.5 P386 L 41 # 3
Johnson, John Broadcom

Comment Type T Comment Status A Reference (bucket)
The TDECQ methods reference channel requirements in Clause 181.8.5.2 instead of the channel requirements in local clause 181.8.5.1.

SuggestedRemedy
Replace the reference to Clause 181.8.5.2 with reference to Clause 181.8.5.1.

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl 181 SC 181.8.5 P386 L 41 # 3
LeCheminant, Greg Keysight Technologies

Comment Type T Comment Status A TDECQ
The current method for optimizing the tap weights of equalizer in the TDECQ reference receiver is described in clause 181.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: ôThe lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibrationö. Note that the MMSE optimization method is used in almost all TDECQ measurements performed today.

SuggestedRemedy
Add the following text at line 53 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #17.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

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EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

**Comment**: Current baseline proposal is lacking tap weight restrictions, which were indicated as TBD when adopted.

**Suggested Remedy**: Propose adopting the TDECQ tap weight restrictions as presented in welch_3dj_01_0524.

**Response**: 

*Welch, Brian*  
Cisco

**Response Status**: C

**Accept in Principle**.  
Resolve using the response to comment #324.

---

**Comment**: The maximum and minimum dispersion values in this table should be replaced by equations similar to ones found in previous clauses (i.e. Table 151-12). This method is sometimes called "CM1".

**Suggested Remedy**: In the minimum column replace 

\[-2.94\]  

with  

\[0.0115 \times \lambda \times \left[1-(1324/\lambda)^4\right]\].  

In the maximum column replace  

\[1.66\]  

with  

\[0.0115 \times \lambda \times \left[1-(1300/\lambda)^4\right]\].  

These are the same values as in Table 151-12 with the coefficient divided by 4.

**Response**: 

*Parsons, Earl*  
CommScope

**Response Status**: C

**Accept in Principle**.  
Implement suggested remedy with editorial license.

---

**Comment**: The required -3dB BW for the measurement system is not achievable with existing technology.  (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52)

**Suggested Remedy**: The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters.  Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method

**Response**: 

*LeCheminant, Greg*  
Keysight Technologies

**Response Status**: C

**Accept in Principle**.  
Resolve using the response to comment #518

---

**Comment**: Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.

**Suggested Remedy**: Delete the acronym IMDD.

**Response**: 

*Maki, Jeffery*  
Juniper Networks

**Response Status**: C

**Accept**.

---

**Comment**: Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.

**Suggested Remedy**: Delete the acronym IMDD.

**Response**: 

*Maki, Jeffery*  
Juniper Networks

**Response Status**: C

**Accept**.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

Comment Type TR

IMDD acronym (bucket)

Comment Status A

Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.

SuggestedRemedy
Delete the acronym IMDD.

Response

ACCEPT.

Response Status C

Maki, Jeffery

Juniper Networks

SuggestedRemedy

Response

ACCEPT.

Response Status C

Cl 182 SC 182.4 P397 L20 # 147

Ghiasi, Ali

Ghiasi Quantum/Marvell

Comment Type T

Precoding

Comment Status A

Prior to 182.4 add section for PMA function to support precoder to mitigate burst errors

SuggestedRemedy

The transmitter need to supports 1/(1+D) mod 4 precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable 1/(1+D) mod 4 precoding to mitigate burst error.

Response

ACCEPT IN PRINCIPLE.

Resolve using response to comment #547.

Response Status C

Cl 182 SC 182.6.1 P401 L21 # 228

Welch, Brian

Cisco

Comment Type TR

TX specs

Comment Status A

In later 100G/P specs (ie, 100BASE-FR1) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.5 dB as it was not updated to reflect the changes to effective TDECQ(min).

SuggestedRemedy

Propose changing "Average launch power, each lane (min)" in Table 182-7 from -2.1 dBm to -2.6 dBm.

Response

ACCEPT IN PRINCIPLE.

Response Status C

Change "Average launch power, each lane (min)" in Table 182-7 from -2.1 dBm to -2.6 dBm.

Response Status C

In Table 182-7, add a footnote to the value "-2.6" on the row for "Average launch power, each lane (min)" with the following text:

"Average launch power of -2.6 dBm corresponds to an OMA of 0.4 dBm with an infinite extinction ratio."

Implement with editorial license.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

**Comment Type:** T  **Comment Status:** A  **power budget**

Although TDECQmax is still TBD. However, the footnote b should also indicate the allocation for penalties, just leave dispersion section as TBD for future update.

**SuggestedRemedy**

Recommend to add "Allocations to penalties for DRx-2 series including penalties due to dispersion TBDdB, DGD and MPI 0.4dB" to footnote b.

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

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #128 with the exception that the value is 0.4dB and not 0.5dB.

Implement with editorial license.

**Comment Type:** TR  **Comment Status:** R  **optical channel specs**

ITU-T G.652.B cabled fiber attenuation is only specified for 1310 nm and 1550 nm wavelengths. It is not specified for wavelengths between 1260 nm and 1310 nm and not meant to be used in xWDM applications.

**SuggestedRemedy**

Remove ITU-T G.652.B (dispersion unshifted) as a fiber option.

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

REJECT.

There is no xWDM in this PMD clause.

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

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

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #339.

**Comment Type:** T  **Comment Status:** A  **Connector labeling**

To support breakout, loopback, and OAN/OLT connectro should be labled

**SuggestedRemedy**

DR2-2 connector should be labeled as Tx1Tx2 ------ Rx2Rx1

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

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #590.

**Comment Type:** T  **Comment Status:** A  **Connector labeling**

To support breakout, loopback, and OAN/OLT connectro should be labled

**SuggestedRemedy**

DR2-4 connector should be labeled as Tx1Tx2Tx3Tx4 ------ Rx4Rx3Rx2Rx1

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

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #590.

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

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

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #339.
Cl 182  SC 182.7.3.1.3  P408  L15  #589
Ghiasi, Ali  Ghiasi Quantum/Marvell
Comment Type  T  Comment Status  A  Connector labeling
To support breakout, loopback, and OAN/OLT connectro should be labeled
SuggestedRemedy
DR2-8 connector should be labeled as Tx1Tx2Tx3Tx4Tx5Tx6Tx7Tx8 Rx8Rx7Rx6Rx5Rx4Rx3Rx2Rx1
Response  Response Status  C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #590.

Cl 182  SC 182.7.3.2  P408  L22  #546
Lambert, Angie  Corning
Comment Type  T  Comment Status  A  IEC revision
IEC 61753-1-1 has been superseded by IEC 61753-1.
SuggestedRemedy
Change "IEC 61753-1-1" to "IEC 61753-1"
Response  Response Status  C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #338.

Cl 182  SC 182.7.3.2  P408  L22  #547
Lambert, Angie  Corning
Comment Type  T  Comment Status  A  IEC revision
IEC 61753-021-2 has been superseded by IEC 61753-021-02.
SuggestedRemedy
Change "IEC 61753-021-2" to "IEC 61753-021-02".
Response  Response Status  C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #339.

Cl 182  SC 182.8.5  P411  L30  #5
Johnson, John  Broadcom
Comment Type  T  Comment Status  A  TDECQ
121.8.5.2 Table 121-11 specifies ORL of 21.4dB be applied for TX testing. For 200GBASE-FR1, this needs to be 17.1dB.
SuggestedRemedy
Add a new exception to the list in 182.8.5:
- The optical return loss is as given in Table 182-7.
Response  Response Status  C
ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.
Cl 182 SC 182.8.5 P411 L30 # 13
Stassar, Peter Huawei Technologies

Comment Type T Comment Status A TDECQ
Currently reference is made to compliance channel in 121.8.5.2, which is for 500m instead of 2km

SuggestedRemedy
Create new subclause 182.8.5.1 and refer to it instead of 121.8.5.2. Create 182.5.2.1 with contents along the lines of 124.8.5.1 from 802.3df with the same compliance channel. Develop with editorial license

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl 182 SC 182.8.5 P411 L30 # 19
LeCheminant, Greg Keysight Technologies

Comment Type T Comment Status A TDECQ
The current method for optimizing the tap weights of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: “The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration.”

SuggestedRemedy
Add the following text at line 44 (end of exceptions list): “The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration.”

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #17

Cl 182 SC 182.8.11 P413 L10 # 15
LeCheminant, Greg Keysight Technologies

Comment Type T Comment Status A RIN-OMA
The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52)

SuggestedRemedy
The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #518

Cl 182 SC 182.9.1 P413 L43 # 50
Lambert, Angie Coming

Comment Type T Comment Status A IEC revision
IEC 60950-1 has been superseded by IEC 62368-1.

SuggestedRemedy
Change "IEC 60950-1" to "IEC 62368-1".

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #342.

Cl 183 SC 183.1 P418 L39 # 305
Maki, Jeffery Juniper Networks

Comment Type TR Comment Status A IMDD acronym (bucket)
Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of “Coherent” to describe inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.

SuggestedRemedy
Delete the acronym IMDD.

Response Response Status C
ACCEPT.
### IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

<table>
<thead>
<tr>
<th>Comment</th>
<th>Type</th>
<th>Status</th>
<th>Suggested Remedy</th>
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</thead>
<tbody>
<tr>
<td>#183</td>
<td>T</td>
<td>A</td>
<td>Prior to 183.4 add section for PMA function to support precoder to mitigate burst errors.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td><strong>Suggested Remedy</strong>&lt;br&gt;<strong>Prior to 183.4 add section for PMA function to support precoder to mitigate burst errors.</strong>&lt;br&gt;The transmitter need to support $1/(1+D) \mod 4$ precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2. 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable $1/(1+D) \mod 4$ precoding to mitigate burst error.</td>
</tr>
<tr>
<td>#183</td>
<td>TR</td>
<td>A</td>
<td><strong>Suggested Remedy</strong>&lt;br&gt;<strong>Total average launch power (max) in Table 183-6 is TBD for 800GBASE-FR4.</strong>&lt;br&gt;Replace TBD with a value equal to the average launch power, each lane (max) + 6 dB, which is $4.9 + 6 = 10.9$ dB. This methodology is consistent with previous FR4 PMDs (clauses 122, 151) and 800GBASE-LR4 in this Table.</td>
</tr>
<tr>
<td>#183</td>
<td>TR</td>
<td>A</td>
<td><strong>Suggested Remedy</strong>&lt;br&gt;Propose changing &quot;Average launch power, each lane (min)&quot; in Table 183-6 from -1.8 dBm to -2.2 dBm.</td>
</tr>
<tr>
<td>#183</td>
<td>TR</td>
<td>A</td>
<td><strong>Suggested Remedy</strong>&lt;br&gt;In later 100G specifications (i.e., 400GBASE-FR4) the difference between OMA(min) and Pave(min) was 3 dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.6 dB as it was not updated to reflect these changes to effective TDECQ(min). Propose changing &quot;Average launch power, each lane (min)&quot; in Table 183-6 from -1.8 dBm to -2.2 dBm.</td>
</tr>
</tbody>
</table>

**Response**<br>Accept in principle. Resolve using response to comment #547.

**Response**<br>Accept in principle. Implement the suggested remedy with editorial license.

**Response**<br>Accept in principle. Resolve using the response to comment #164.
**Comment Type** TR  **Comment Status** A  **TX specs**

**Recommended relationship between 'Tx_OMAout (min)' and 'Tx_Pavg (min)' for 800G LR4** (in Table 183-6) should follow 400G LR4-6, with delta equal to 3dB, assuming max . OER infinite.

**SuggestedRemedy**
With 'OMAout (min)'=1.9dBm, then 'Average launch power, each lane' for 800G LR4 in Table 183-6 should be changed to -1.1dBm.

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

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

In Table 183-6 for LR4 change "Average launch power, each lane (min)" from -0.9 to -1.1

In Table 183-6, add a footnote to the value "-1.1" on the row for "Average launch power, each lane (min)" with the following text:
"Average launch power of -1.1 dBm corresponds to an OMA of 1.9 dBm with an infinite extinction ratio."

With editorial license.

---

**Comment Type** T  **Comment Status** A  **TX specs**

The TX must be compliant over the full range of fiber length (dispersion), so the use of TDECQ alone is insufficient to determine Outer Optical Modulation Amplitude (OMAouter), each lane (min) in Table 183-6 for 800GBASE-FR4/LR4.

**SuggestedRemedy**
Replace TDECQ with max(TECQ, TDECQ) for both PMDs, as has been done in all other PMDs in Clauses 180-182. Note that max(TECQ, TDECQ) is already in Equation 183-1. For consistency, replace "Equation 183-1" with "0.1 + max(TECQ, TDECQ)" in Table 183-6, and delete Equation 183-1 on page 435, line 20. Also update Figures 183-3, 183-5, 183-6 and surrounding text with max(TECQ, TDECQ).

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

ACCEPT IN PRINCIPLE.
Implement suggest remedy with editorial license.

---

**Comment Type** TR  **Comment Status** A  **RX specs**

The delta between 'Tx_Pavg(min)' and 'Rx_Pavg(min)' should equal to 'Channel insertion loss' (4.0dB for FR4)

**SuggestedRemedy**
Rx_Pavg (min)' in Table 183-7 should be -2.2dB-4.0dB=-6.2dBm

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

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

---

**Comment Type** TR  **Comment Status** A  **RX specs**

For Table 183-7, in the 800GBASE-FR4 column, change the value for "Average receive power, each lane (min)" to -6.2.
Comment Type TR Comment Status A RX specs
The delta between 'Tx_Pavg(min)' and 'Rx_Pavg(min)' for 800G LR4 should equal to 'Channel insertion loss' (6.3dB for LR4)

SuggestedRemedy
Rx_Pavg (min)' for 800G LR4 in Table 183û7 should be -1.1dBm-6.3dB=-7.4dBm

ACCEPT IN PRINCIPLE.
For Table 183-7, in the 800GBASE-LR4 column, change the value for "Average receive power, each lane (min)" to -7.4.

Comment Type T Comment Status A RX specs
Difference in receive power between any two lanes (OMAouter) (max) in Table 183-7 is TBD for 800GBASE-FR4.

SuggestedRemedy
Replace TBD with a value of 4.1 dB, consistent with other FR4 PMDs (Cl. 122, 151)

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Comment Type T Comment Status A power budget
Adding explanation on allocation for penalties calculation.

SuggestedRemedy
Use same approach than for the insertion loss adding a note in the LR4 value with the text:"Allocation for penalties is calculated using an additional penalty of 0.7dB from DGD, and 0.4dB from MPI"

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

Comment Type T Comment Status A power budget
The positive and negative dispersion values in this table should come from a channel model that uses a statistical approach. A contribution on fiber dispersion statistics will be submitted.

SuggestedRemedy
Replace TBDs with values agreed upon by the Task Force.

Response Response Status C
REJECT.
The following presentation was reviewed by the 802.3dj task force at the May Interim meeting:
https://www.ieee802.org/3/dj/public/24_05/parsons_3dj_01a_2405.pdf
The presentation provided an overview of the latest fiber data set that could be used to determine dispersion parameters but no specific values were provided or directions on how to modify the draft.

Comment Type T Comment Status A power budget
Although TDECQmax is still TBD. However, the footnote b should also indicate the allocation for penalties, just leave dispersion section as TBD for future update.

SuggestedRemedy
Recommend to add "Allocations to penalties for 800G-FR4 including penalties due to dispersion TBDdB, DGD and MPI 0.5dB" to footnote e.

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #171.

Comment Type T Comment Status A power budget
Footnote e did not clarify what's the composition of total 5dB allocation for penalties.

SuggestedRemedy
Recommend to add "Allocations to penalties for 800G-LR4 including penalties due to dispersion 3.9dB, DGD 0.7dB and MPI 0.4dB" to footnote e.

Response Response Status C
ACCEPT IN PRINCIPLE.
Resolve using the response to comment #502.

Comment Type T Comment Status A optical channel specs
The following presentation was reviewed by the 802.3dj task force at the May Interim meeting:
https://www.ieee802.org/3/dj/public/24_05/parsons_3dj_01a_2405.pdf
The presentation provided an overview of the latest fiber data set that could be used to determine dispersion parameters but no specific values were provided or directions on how to modify the draft.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

**Comment Type** | **Comment Status** | **Clause** | **Subclause** | **Page** | **Line** | **#**
--- | --- | --- | --- | --- | --- | ---
T | A | 183.7.1 | P431 | L31 | 125

- **Comment:** Clause 183.7.1 is TBD.
- **Suggested Remedy:** Use the same text and table as given in 182.7.1. Since this sub-clause only reiterates fiber cable specs from external standards, not 802.3 specific specs, this should not be controversial.
- **Response:** ACCEPT IN PRINCIPLE. Implement the suggested remedy with editorial license.

---

**Comment Type** | **Comment Status** | **Clause** | **Subclause** | **Page** | **Line** | **#**
--- | --- | --- | --- | --- | --- | ---
T | A | 183.7.2 | P431 | L41 | 126

- **Comment:** Clause 183.7.2 is TBD.
- **Suggested Remedy:** Use the same text as given in 182.7.2: "An optical fiber connection, as shown in Figure 183-7, consists of a mated pair of optical connectors." Since this is a basic definition of terms, it should not be controversial.
- **Response:** ACCEPT IN PRINCIPLE. Implement the suggested remedy with editorial license.

---

**Comment Type** | **Comment Status** | **Clause** | **Subclause** | **Page** | **Line** | **#**
--- | --- | --- | --- | --- | --- | ---
T | A | 183.7.3 | P432 | L40 | 351

- **Comment:** IEC 61753-021-2 has been superseded by IEC 61753-021-02.
- **Suggested Remedy:** Change "IEC 61753-021-2" to "IEC 61753-021-02".
- **Response:** ACCEPT IN PRINCIPLE. Resolve using the response to comment #339.

---

**Comment Type** | **Comment Status** | **Clause** | **Subclause** | **Page** | **Line** | **#**
--- | --- | --- | --- | --- | --- | ---
T | A | 183.8.5 | P435 | L25 | 20

- **Comment:** The current method for optimizing the tap weights of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: 6The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration. Note that the MMSE optimization method is used in almost all TDECQ measurements performed today.
- **Suggested Remedy:** Add the following text at line 40 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration.
- **Response:** ACCEPT IN PRINCIPLE. Resolve using the response to comment #17.

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**Comment Type** | **Comment Status** | **Clause** | **Subclause** | **Page** | **Line** | **#**
--- | --- | --- | --- | --- | --- | ---
T | A | 183.8.11 | P437 | L41 | 56

- **Comment:** The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52).
- **Suggested Remedy:** The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method.
- **Response:** ACCEPT IN PRINCIPLE. Resolve using the response to comment #518.

---

**Comment Type** | **Comment Status** | **Clause** | **Subclause** | **Page** | **Line** | **#**
--- | --- | --- | --- | --- | --- | ---
T | A | 183.8.11 | P437 | L41 | 16

- **Comment:** The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52).
- **Suggested Remedy:** The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method.
- **Response:** ACCEPT IN PRINCIPLE. Resolve using the response to comment #518.

---

**Comment Type** | **Comment Status** | **Clause** | **Subclause** | **Page** | **Line** | **#**
--- | --- | --- | --- | --- | --- | ---
T | A | 183.8.11 | P437 | L41 | 56

- **Comment:** The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52).
- **Suggested Remedy:** The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method.
- **Response:** ACCEPT IN PRINCIPLE. Resolve using the response to comment #518.

---

**Comment Type** | **Comment Status** | **Clause** | **Subclause** | **Page** | **Line** | **#**
--- | --- | --- | --- | --- | --- | ---
T | A | 183.8.11 | P437 | L41 | 16

- **Comment:** The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetector to be substantially higher than 120 GHz to achieve the current system bandwidth required for the test system, as defined in clause 52).
- **Suggested Remedy:** The bandwidth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method.
- **Response:** ACCEPT IN PRINCIPLE. Resolve using the response to comment #518.
Cl 184 SC 184.1.1 P441 L8 # 808
Bruckman, Leon Huawei

Comment Type TR Comment Status A General (Bucket)
The Inner FEC as defined, includes the PMA. Shall make this clear to the reader

SuggestedRemedy
Either add sentence: "This Inner FEC sublayer includes functionality often associated with the PMA sublayer", or split the PMA function

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement the following with editorial license.
Add sentence: "This Inner FEC sublayer includes functionality often associated with the PMA sublayer at the PMD service interface".
Add similar text to the appropriate sub clause in clause 177
[Editor's note: CC 184, 177]

Cl 184 SC 184.2 P443 L7 # 57
Huber, Thomas Nokia

Comment Type T Comment Status R General (Bucket)
Other diagrams of this type do not have dashed boxes around the transmit and received processes.

SuggestedRemedy
For consistency with the rest of the document, remove the dashed boxes

Response Response Status C
REJECT.

The dashed boxes clearly denote the transmit and receive functions. Removing the dashed boxes does not improve clarity of the draft.

Cl 184 SC 184.2 P444 L5 # 85
Huber, Thomas Nokia

Comment Type T Comment Status A Functional (Bucket)
The second sentence of the paragraph (discussing the distribution to 32 lanes by the permutation function) seems to imply that the 32 lanes were interleaved into a serial stream after they were reordered and deskeewed, but the text doesn't actually say that is done.

SuggestedRemedy
If the intent is that the 32 lanes are re-interleaved, and then the permutation function distributes the symbols back to 32 lanes (in something other than a round-robin manner), change the end of the first sentence to say "are ordered, deskeewed, and serialized". If the intent is that the permutation process just moves symbols around among the 32 lanes, change the second sentence to say "The RS-FEC symbols are then rearranged across the 32 lanes by a permutation function.".

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement the following with editorial license.
Change "The RS-FEC symbols are then distributed over the 32 lanes by a permutation function." to "The RS-FEC symbols are then rearranged across the 32 lanes by a permutation function."

Cl 184 SC 184.4 P445 L22 # 184
Brown, Matt Alphawave Semi

Comment Type T Comment Status A Reorder (Bucket)
The Inner FEC transmit (184.4) and receive (184.5) functions provide a BCH encoder/decoder and other functions to be performed on each PCS lane. Although there is one per PCS lane, these should be called "flows" rather than "lanes" to be consistent with other FEC clauses and to differentiate between "lanes" that go between sublayers.

SuggestedRemedy
When describing the process applied to each PCS lane in each direction, use the word "flow" rather than "lane".

Response Response Status C
ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC 184.4.1</th>
<th>P445</th>
<th>L3</th>
<th>#299</th>
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<td>alphawave semi</td>
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<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td><strong>Functional (bucket)</strong></td>
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<tr>
<td>Need to further define the deskew requirement. For now it is defined as optional. In practice full deskew is optional, but doing 10b alignment of RS symbols is mandatory.</td>
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<tr>
<td><strong>Suggested Remedy</strong></td>
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<tr>
<td>Replace lines 8-18 with the requirement of partial deskew, which means 10b RS symbols resolution deskew.</td>
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<td></td>
<td><strong>Response Status</strong></td>
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<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
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<td></td>
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<tr>
<td>Implement the following with editorial license.</td>
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<tr>
<td>In the first paragraph of clause 184.4.1 delete &quot;, when implemented,&quot; and delete the second paragraph.</td>
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<td>Huber, Thomas</td>
<td>Nokia</td>
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<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td><strong>Functional (bucket1p)</strong></td>
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<tr>
<td>There are always many implementation options, but we don't have to describe them in the document, we just have to describe the behavior that is required.</td>
<td></td>
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<tr>
<td><strong>Suggested Remedy</strong></td>
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<tr>
<td>Delete &quot;when implemented&quot; from the first sentence, and delete the second paragraph.</td>
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<th>P445</th>
<th>L12</th>
<th>#178</th>
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<tr>
<td>Brown, Matt</td>
<td>Alphawave Semi</td>
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<td></td>
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</tr>
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<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td><strong>Functional (bucket1p)</strong></td>
</tr>
<tr>
<td>The process provided in 184.4.1 “Alignment lock and deskew” merely maps bits on the FEC service interface to vectors; it does not include and RS-FEC symbol alignment. The process in 184.4.2 remaps the vectors such that there is alignment to the RS-FEC symbols and the lanes are properly ordered.</td>
<td></td>
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<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Either combine the two subclauses and process into one subclause or move the RS-FEC symbol alignment process in 184.4.2 to 184.4.1.</td>
<td></td>
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<tr>
<td><strong>Response</strong></td>
<td></td>
<td><strong>Response Status</strong></td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Implement the following with editorial license.</td>
<td></td>
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</tr>
<tr>
<td>Move the RS-FEC symbol alignment process in 184.4.2 to 184.4.1.</td>
<td></td>
<td></td>
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</tr>
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</table>

<table>
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</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td><strong>Reorder. (Bucket)</strong></td>
</tr>
<tr>
<td>Need to further define the lanes reorder requirement. For now it is defined as optional. In practice full lanes reorder is optional, but partial reorder, meaning having flow-0 on lanes 0-15 and flow-1 on lanes 16-31 is required. Not doing that would impact end to end FEC performance and margins.</td>
<td></td>
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<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two options:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. remove the word 'optional' from line 22.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2. Define the restriction of having flow-0 on lanes 0-15 and flow-1 on lanes 16-31.</td>
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</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
<td><strong>Response Status</strong></td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
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</tr>
<tr>
<td>Implement the following with editorial license.</td>
<td></td>
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</tr>
<tr>
<td>Change: “If that is the case, the optional lane reorder function shall order the PCS lanes according to the PCS lane number.” to: “The lane reorder function shall order the PCS lanes according to the PCS lane number.”</td>
<td></td>
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</tbody>
</table>
The lane reorder process is stated as being optional, however, that is not the case. It is not required (or optional) if the lanes are already in order (e.g., connected to a PCS above) and mandatory if the lanes may not be in order (e.g., connected to an 8:32 PMA above), thus it is conditional, rather than optional.

Suggested Remedy
Change the first 2 sentences in 184.4.2 to "If the sublayer above the Inner FEC does not provide the PCS lanes in order at the service interface, the lane reorder function shall reorder the PCS lanes according to the PCS lane number."

Response
ACCEPT.

This is not clear, nor is the relationship of the figure to the pseudocode beneath it. I think the columns 0-3 are just numbers that relate to the post-FEC distribution process. I have no idea why there are 32 sets of 4 symbols, as the algorithm doesn't do anything on a four-symbol basis. The function is simply reversing flow1 and flow0 every two columns, so that each lane has interleaved symbols from all four codewords. This could be described more simply by using blocks of 16 symbols in the figure (i.e., block 0 would be lanes 0-15 in column 0, block 1 would be lanes 16-31 in column 0, etc.).

Suggested Remedy
Revise the figure as suggested. The input side would look like this (where each row here is corresponding to 16 PCS lanes i nthe figure):

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

and the output would be

<p>| | | | |</p>
<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

This will remove any confusion about whether the 32 blocks are supposed to be somehow related to the 32 PCS lanes, and it will be easier to see what is changing between the figures.

Response
ACCEPT IN PRINCIPLE.

Other clauses about reordering don't have this.

Suggested Remedy
Delete the last paragraph

Response
ACCEPT IN PRINCIPLE.
Comment Type: T
Comment Status: R
Algorithm (bucket1p)

The algorithm is unnecessarily complex. There is no need for bit-level detail since the operation is performed on 160-bit entities. Per figure 184-3, it's essentially receiving as input alternating sets of 160 bits from flow0 and flow1, and changing the order from 0, 1, 0, 1, 0, 1, 0, 1 to 0, 1, 0, 1, 1, 0, 1, 0.

Suggested Remedy

A minimal change would be to state that the algorithm operates on 10-bit symbols, delete the for jà loop and its terminator, and replace "10i+j" with "i" in the statement that describes the permutation.

Another option would be to rewrite the description around the 160-bit entities as described, and perhaps also change the figure to show those instead of 40-bit entities (which as noted in a previous comment seem to have no relevance to this process, or to the convolutional interleaver process that follows it).

Response

REJECT.
The algorithm is correct and unambiguous as written, and reflects the adopted baseline. There is sympathy for the direction of the suggested remedy; however, a more complete consensus proposal would be needed to change the current description.

Comment Status: R
Response Status: C

Comment Type: T
Comment Status: A
Algorithm (Bucket)

The description of the convolutional interleaver process could be improved. The variable i is used in the first part of the subclause as an index for the delay lines and as an indication of time within a sequence. Then at the bottom of page 447 it's used a symbol index.

There is sympathy for the direction of the suggested remedy; however, a more complete consensus proposal would be needed to change the current description.

Response

ACCEPT IN PRINCIPLE.

The text above figure 184-4 already provides an algorithmic description of how the interleaver works. Rather than a second algorithmic description, it might be better to show the worked example as noted in the comment - i.e., show a table of input blocks from 0 to 42, and the corresponding output blocks.

Suggested Remedy

The text above figure 184-4 already provides an algorithmic description of how the interleaver works. Rather than a second algorithmic description, it might be better to show the worked example as noted in the comment - i.e., show a table of input blocks from 0 to 42, and the corresponding output blocks.

Response

ACCEPT IN PRINCIPLE.

Resolves using the response to comment #613.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

Huang, Kechao  
Huang Technologies Co., Ltd.

Comment Type: T  
Comment Status: A  
Algorithm

For perfom[40x(i-18x i mod 3)+j], the column index 40x(i-18x i mod 3)+j may be a negative value.

Suggested Remedy

Suggest to add one sentence after Line 9: When 40x(i-18x i mod 3)+j is negative, perfom is undefined from initial buffer of the convolutional interleaver.

Response  
Response Status: C

ACCEPT IN PRINCIPLE.
Implement the following with editorial license.
Add the following sentence after Line 9: "When 40x(i-18x i mod 3)+j is negative, perfom is undefined."

Huber, Thomas  
Nokia

Comment Type: T  
Comment Status: A  
Algorithm (Bucket)

The first statement should not be a 'shall' (which indicates a PICS item of conformance).
The second sentence is correct, in that there are 32 encoders, but what's actually required is that each lane has an encoder.

Suggested Remedy

Revise the paragraph to read: The BCH encoder works in conjunction with the RS(544,514) FEC to increase the FEC coding gain. Each encoder process for each PCS lane.

Response  
Response Status: C

ACCEPT IN PRINCIPLE.
Implement the following with editorial license.
Change the line above the dashed list to say: "The BCH encoding is done separately on each lane. The encoding of each BCH codeword is defined as follows:"

At the top of page 449, remove the 'for pà' loop from the pseudocode.

Response  
Response Status: C

ACCEPT IN PRINCIPLE.

The algorithm is correct as written, and reflects the adopted baseline. However, "p" is used for another purpose in the previous subclause.

Response  
Response Status: C

REJECT.

The algorithm is correct and unambiguous as written, and reflects the adopted baseline.
### IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

<table>
<thead>
<tr>
<th>Cl</th>
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<th>Comment Status</th>
<th>Order (Bucket)</th>
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<tr>
<td>184</td>
<td>184.4.7.1</td>
<td>T</td>
<td>A</td>
<td>DSP (Bucket)</td>
</tr>
<tr>
<td>184</td>
<td>184.4.7.1</td>
<td>T</td>
<td>A</td>
<td>DSP (Bucket)</td>
</tr>
<tr>
<td>184</td>
<td>184.4.7.1</td>
<td>T</td>
<td>A</td>
<td>DSP (Bucket)</td>
</tr>
<tr>
<td>184</td>
<td>184.4.7.1</td>
<td>T</td>
<td>A</td>
<td>DSP (Bucket)</td>
</tr>
</tbody>
</table>

**Huber, Thomas**

**Nokia**

**Comment Type** T  **Comment Status** A  **Order (Bucket)** DSP (Bucket)

1. **The DSP frame should probably be a level 3 clause of its own, rather than a sub-clause under BCH interleaver.**

   **SuggestedRemedy**
   Change to a level 3 heading

   **Response**
   ACCEPT IN PRINCIPLE.

   The "BCH interleaver" function includes the pilot insertion. Change clause 184.4.7 title to:

   "BCH interleaver and pilot insertion" Implement with editorial license.

2. **It is said "4-bit pilot symbols (PS) are inserted every 64 4-bit blocks (one 4-bit PS, 63 4-bit message blocks)." But in Figure 184-5, message blocks m<0:63>, m<64-127>, åbetwen pilot symbols has 64 4-bit blocks.**

   **SuggestedRemedy**
   Change Figure to match the text, i.e., change m<0:63> to m<0:62>, change m<64:127> to m<63:125>, etc.

   **Response**
   ACCEPT IN PRINCIPLE.

3. **It is not clear what "192 bits that are complemented with zeros" is intended to mean. Based on what is in Table 184-2, I think the intent is that a zero is inserted after each bit of the PRBS9 output to form the bitpairs that become the PS symbols. Also, the text talks about 4-bit PS symbols, but Table 184-2 is showing bitpairs for each component rather than 4-bit symbols without explaining that outputs 0 and 1 are for the X polarization (so the X PRBS is spread across outputs 0 and 1) and outputs 2 and 3 are for the Y polarization.**

   **SuggestedRemedy**
   Revise the two paragraphs above table 184-1 to read as follows:

   "For both DSP frame 0 and DSP frame 1, the generator is initialized using the seed at the start of every DSP frame. The generator produces a sequence of 192 bits. A zero bit is inserted after each bit to generate the bitpairs that form the pilot symbols, which use the outer points of the 16QAM constellation."

   The generator polynomial and seed values are shown in Figure 184-6 and listed in Table 184-1. The complete pilot sequence is shown in Table 184-2. The bitpairs for the X polarization are distributed in a round-robin manner to outputs 0 and 1. The bitpairs for the Y polarization are distributed in a round-robin manner to outputs 2 and 3.

   **Response**
   ACCEPT.

4. **The editor's note suggesting that the mapping to analog signals probably belongs in the PMD clause seems to make sense, in which case this clause is really not "DP-16QAM mapping", it's really just mapping to 4-level signals, which the PMD will then turn into DP-16QAM.**

   **SuggestedRemedy**
   Change the title to "4-level signal mapper", and make the corresponding change in 184.5.3.

   **Response**
   ACCEPT.

---

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

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

**SORT ORDER:** Clause, Subclause, page, line
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

**Comment Type:** T  **Comment Status:** R

**Huber, Thomas**  **Nokia**

**Comment:**

The overall flow would be improved if it went BCH interleaver, 4-level signal mapping, DSP frame, with all the pilot symbol details then in the DSP frame clause.

**Suggested Remedy:**

Revise so the flow is like this:

184.4.7 BCH interleaver
184.4.8 Four-level signal mapping (current 184.4.9, without subclauses)
184.4.9 DSP frame generation (current 184.4.7.1)
184.4.9.1 Pilot sequence (current 184.4.7.2 and 184.4.9.1)

**Response:** REJECT.

The text is correct as written. The actual order is the right one. It describes the bit blocks generation and handling, then the mapping to four levels.

---

**Comment Type:** T  **Comment Status:** R

**Huber, Thomas**  **Nokia**

**Comment:**

The paragraph that begins with "the signals Rx_XI, Rx_XQ, à" doesn't seem to make sense. The Tx and Rx signals are not guaranteed to be the same (i.e., Tx_XI can be received as any of the four components), but the contents of Tx_XI aren't distributed to all the Rx signals.

**Suggested Remedy:**

Revise to say: The signals Rx_XI, Rx_XQ, Rx_YI, and Rx_YQ each represent one of the corresponding Tx_XI, Tx_XQ, Tx_YI, Tx_YQ signals from the transmitting PMD. The association between Tx and Rx components is arbitrary (e.g., Rx_XI can be any of the 4 Tx components).

**Response:** REJECT.

This comment was WITHDRAWN by the commenter.
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
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<th>L</th>
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<tbody>
<tr>
<td>184</td>
<td>184.6.5</td>
<td>462</td>
<td>3</td>
<td>307</td>
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<td>Comment Status</td>
<td>A</td>
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<tr>
<td>Bruckman, Leon</td>
<td>Huawei</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Set TBD values of N and M</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**SuggestedRemedy**

- Set N=12, M=8. See contribution bruckman_3dj_01_241205

**Response**

Response Status C

*ACCEPT IN PRINCIPLE.*

The following presentation (referenced in the suggested remedy) was reviewed by the 802.3dj task force at the May Interim meeting:

https://www.ieee802.org/3/dj/public/24_05/bruckman_3dj_01a_2405.pdf

Implement the suggested remedy with editorial license.

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<table>
<thead>
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<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
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<td>184.6.5</td>
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<td>9</td>
<td>559</td>
</tr>
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<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Law, David</td>
<td>HPE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>The LOCK_INIT state in Figure 184-9 DSP lock state diagram includes the action 'test_sym &lt;= false', however the test_sym variable isn't defined in subclause 184.6.2 'Variables' and isn't used anywhere else in Figure 184-9. It seems that this should have been 'test_ps &lt;= false' as the test_ps variable isn't initialised during reset in the LOCK_INIT state but used to control the GET_SYMBOL to FIND_1ST transition below.</td>
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</table>

**SuggestedRemedy**

- Change 'test_sym <= false' to read 'test_ps <= false'.

**Response**

Response Status C

*ACCEPT.*

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<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
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<tbody>
<tr>
<td>184</td>
<td>184.6.5</td>
<td>462</td>
<td>22</td>
<td>560</td>
</tr>
<tr>
<td>Law, David</td>
<td>HPE</td>
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<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Diagrams (Bucket)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>N (the number of consecutive PS symbols matching the expected value for a given polarization stream required to enter frame lock), and M (the number of consecutive PS symbols that don't match the expected value for a given polarization stream required to exit frame lock) used in Figure 184-9 'DSP lock state diagram' aren't defined in subclause 184.6 'Inner FEC state diagrams' or its subclauses. Suggest that these values should be defined in one place (I assume in subclause 184.5.4 'DSP frame synchronization and pilot removal' which includes the text 'The values of N and M are TBD.'), with a pointer to this subclause elsewhere.</td>
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</tbody>
</table>

**SuggestedRemedy**

- [1] Insert a new subclause 184.6.5 'Constants' as follows, renumbering the following subclause.

  - 184.6.5 Constants
  - M
  - The number of consecutive PS symbols that fail to match the expected value for a given polarization stream required to exit frame lock (see 184.5.4). N The number of consecutive PS symbols matching the expected value for a given polarization stream required to enter frame lock (see 184.5.4).

  - [2] In subclause 184.6.2 'Variables', change the text 'It is set to true when TBD PS symbols ...' to read 'It is set to true when M PS symbols ...' in the variable 'restart_lock' description.

**Response**

Response Status C

*ACCEPT IN PRINCIPLE.*

In the first paragraph of clause 184.5.4 remove: "The values of N and M are TBD."

Insert new subclause 184.6.5 "Constants" after subclause 184.6.4 as follows, renumbering the subsequent subclause:

```
184.6.5 Constants

M
- The number of consecutive PS symbols that fail to match the expected value for a given polarization stream required to exit frame lock (see 184.5.4). M = 8.

N
- The number of consecutive PS symbols matching the expected value for a given polarization stream required to enter frame lock (see 184.5.4). N = 12.
```

In subclause 184.6.2 'Variables', change the text for "restart_lock" from:


**Comment**

"It is set to true when TBD PS symbols ..." to: "It is set to true when M PS symbols ..."

Implement with editorial license.

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Page</th>
<th>Line</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>184</td>
<td>184.6.5</td>
<td>463</td>
<td>6</td>
<td>E</td>
<td>A (editorial)</td>
<td>The variable 'alignment_status' used in the LOSS_OF_ALIGNMENT and ALIGNMENT_ACQUIRED states is misspelt.</td>
<td>Suggest that 'alignment_status' should read 'alignment_status'.</td>
</tr>
</tbody>
</table>
| 184 | 184.8 | 464 | 10 | TR           | A             | Only "alignment_valid" is reported, not individual "dsp_lock<x>" variables. | SuggestedRemedy

**Comment**

It is recommended to report both "dsp_lock<x>" in table 184-7, as we did for PCS lane lock where we reported "Lane x aligned" for all PCS lanes.

Implement with editorial license and discretion.

<table>
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<tr>
<th>Cl</th>
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<th>Line</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| 184 | 184 | 464 | 10 | TR           | A             | | SuggestedRemedy

**Comment**

Table 185-1, Figure 185-1, Figure 185-2 does not reflect the PHY type and clause correlation in Table 169-3a. There is no mention of 800GBASE-R BM-PMA, 800GAU-I8 2C2, 800GAU-I8 2C2M, 800GBASE SM-PMA, 800GAU-I4 C2C, and 800GAU-I4 C2M.


**Suggested Remedy**

Clause 185 needs to be updated to reflect these layers.

Table 185-1 needs the following entries:

- 800GBASE-R BM-PMA - conditional
- 800GAU-I8 2C2 - optional
- 800GAU-I8 2C2M - optional
- 800GBASE SM-PMA - conditional
- 800GAU-I4 C2C - optional
- 800GAU-I4 C2M - optional

Add note "C= Conditional, 800GBASE-R BM-PMA is conditional, pending implementation of 800GAU-I8 2C2/C2M/2C2M" to Table 185-1.

Figure 185-1 should include a PMA sublayer in the diagram and be added to legend below Figure 185-2 needs to be updated to show the 800GBASE-R PMA Sublayer and service interface between the PCS and Inner FEC.

**Response**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #372.

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Page</th>
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<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| 185 | 185.1 | 468 | 19 | TR           | A             | | SuggestedRemedy

**Comment**

Some optional and conditional sublayers are missing from Table 185-1 and the conditions for include the SM-PMA and BM-PMA should be included in this table.

Regarding Figure 185-1 and Figure 185-2, no PMA is shown because the 800GBASE-LR1 Inner FEC sublayer connects directly with the PCS; a PMA is not required between the PCS and the 800GBASE-LR1 Inner FEC. Note that the 800GBASE-LR1 Inner FEC subsumes some functions/services normally provided by a PMA for the PMD.

Add the following rows in Table 185-1:

- 800GBASE-R BM-PMA - conditional
- 800GAU-I8 2C2 - optional
- 800GAU-I8 2C2M - optional
- 800GBASE SM-PMA - conditional
- 800GAU-I4 C2C - optional
- 800GAU-I4 C2M - optional

Resolve the concern about conditional SM-PMA and BM-PMA related to Table 185-1 using the response to comment #317.

Implement with editorial license.
The TBDs need to be replaced by values. Follow the same methodology as in 154 and latest draft D3.0 of P802.3cw

**Suggested Remedy**

Replace contents by The sum of the transmit and receive delays at one end of the link contributed by the 800GBASE-LR1 PMD including 2 m of fiber in one direction shall be no more than 16 384 bit times (32 pause_quanta or 20.48 ns).

A description of overall system delay constraints and the definitions for bit times and pause_quanta can be found in 169.4 and its references.

**Response**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy and update Table 169-4 with editorial license.

---

800GBASE-LR1 is being defined to allow unlocked lasers with frequency errors larger than the DSP digital acquisition range. Additional parameters are required for the Tx laser to accommodate this. Values will be provided after further study, but the new parameters can be added to Table 185-4. A supporting contribution will be provided.

**Suggested Remedy**

Add the following parameters to Table 185-4:

- Maximum Tx laser frequency slew rate: Preacquisition [Units GHz/s]
- Maximum Tx laser frequency slew rate: Post acquisition [Units GHz/ms]
- Laser Relative Frequency tracking accuracy [Units GHz]

**Response**

ACCEPT IN PRINCIPLE.

Implement suggestion remedy with editorial license.

---

The specification should have a Tx clock noise defined.

**Suggested Remedy**

Add an entry for Tx clock phase noise (PN): Maximum PN mask

Add an entry for: Tx clock phase noise (PN); Maximum total integrated random jitter

Add an entry for: Tx clock phase noise (PN); Maximum total periodic jitter

**Response**

ACCEPT IN PRINCIPLE.

Implement suggestion remedy with editorial license.

---

TQM is currently undefined. Recommend adopting RSNR Penalty as a TQM. Supporting Contribution to be provided.

**Suggested Remedy**

Replace TQM with RSNR Penalty

**Response**

REJECT.

The following presentation was reviewed by the 802.3dj task force at the May Interim meeting:


No agreement yet on an appropriate quality metric therefore no consensus to make a change.

---

The following presentation was reviewed by the 802.3dj task force at the May Interim meeting:


Implement suggestion remedy with editorial license.
Minimum transmit power specification has a big impact on coherent module designs. This has been defined in the initial proposals as a specification on the average power following other coherent physical layer specifications defined for DWDM systems. However, there is opportunity for a 800GBASE-LR1 PMD to change this in a way which can relax module transmit specifications.

**Suggested Remedy**

Define the minimum transmit power specification to be defined per lane instead of average. See https://grouper.ieee.org/groups/802/3/dj/public/23_11/kota_3dj_01a_2311.pdf for an initial proposal based on this concept. Defining the power per lane provides an opportunity to relax lane mismatch specs.

**Response**

REJECT.

This comment was WITHDRAWN by the commenter.

---

The draft contains separate specifications of X-Y power imbalances and I-Q imbalance. However, there is an opportunity for a 800GBASE-LR1 PMD to change this in a way which can relax module transmit specifications.

**Suggested Remedy**

Having a separate X-Y and I-Q imbalance specification splits the imbalance power budget and results in a tighter specification than necessary. These specifications should be combined into a single lane-to-lane imbalance specification. See https://grouper.ieee.org/groups/802/3/dj/public/23_11/kota_3dj_01a_2311.pdf for an initial specification methodology proposal.

**Response**

REJECT.

This comment was WITHDRAWN by the commenter.
IEEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comments

### Comment 352

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 374

**Comment Type:** TR  **Comment Status:** A  **test pattern (common)**

The 800GBASE-LR1 Inner FEC would not see or use scrambled idles as its input. The input to the 800GBASE-LR1 Inner FEC should be "scrambled idle processed by 800GBASE-R PCS".

**SuggestedRemedy**

Change "pattern description" column in Table 185-9 to "Scrambled idle procedd by 800GBASE-R PCS and then encoded by the 800GBASE-LR1 Inner FEC".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 375

**Comment Type:** TR  **Comment Status:** A  **test pattern (bucket)**

The scrambled idle test pattern for 800GBASE-R PCS is defined in 172.2.4.11, not 175.2.4.11.

**SuggestedRemedy**

Change "175.2.4.11" to "172.2.4.11" and format as external reference.

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Implement suggested remedy with editorial license.

---

### Comment 353

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.

---

### Comment 334

**Comment Type:** T  **Comment Status:** A  **IEC revision**

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

**SuggestedRemedy**

Change "IEC 61753-021-2" to "IEC 61753-021-02".

**Response**  
**Response Status:** C  
ACCEPT IN PRINCIPLE.  
Resolve using the response to comment #339.
EEE P802.3dj D1.0 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 1st Task Force review comment

**Comment Type:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

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

**SORT ORDER:** Clause, Subclause, page, line

**Cl 186 SC 186 P491 L1 # 108**

Huber, Thomas  Nokia

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

The baseline for the 800GBASE-ER1[-20] PCS has issues with PTP accuracy when an extender sublayer is used.

**Suggested Remedy**

Update the baseline per presentations in the May meeting proposing a mechanism to reduce the PTP inaccuracy.

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

ACCEPT IN PRINCIPLE.

Resolve using the proposal in [https://www.ieee802.org/3/dj/public/24_05/sluyski_3dj_01a_2405.pdf](https://www.ieee802.org/3/dj/public/24_05/sluyski_3dj_01a_2405.pdf), which was presented in the May interim meeting. Implement the suggested remedy in sluyski_3dj_01a_2405 with editorial license.

---

**Cl 187 SC 187.3 P497 L31 # 115**

Stassar, Peter  Huawei Technologies

*Comment Type:* T  *Comment Status:* A  *Delay*

The TBDs need to be replaced by values. Follow the same methodology as in 154 and latest draft D3.0 of P802.3cw

**Suggested Remedy**

Replace contents by The sum of the transmit and receive delays at one end of the link contributed by the 800GBASE-LR1 PMD including 2 m of fiber in one direction shall be no more than 16.384 bit times (32 pause_quanta or 20.48 ns).

A description of overall system delay constraints and the definitions for bit times and pause_quanta can be found in 169.4 and its references.

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

ACCEPT IN PRINCIPLE.

Implement the suggested remedy and update Table 169-4 with editorial license.

---

**Cl 187 SC 187.5 P502 L17 # 117**

Stassar, Peter  Huawei Technologies

*Comment Type:* T  *Comment Status:* A  *RX specs*

Previously for Clause 154 and draft Clause 156 in D3.0 for P802.3cw 20 dB maximum receiver reflectance has been used, which is a common value in the industry and in draft Clause 155.5.2

**Suggested Remedy**

For Receiver reflectance (max) replace TBD by 20 dB for both ER1-20 and ER1

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

ACCEPT.

---

**Cl 187 SC 187.5.1 P501 L8 # 109**

Huber, Thomas  Nokia

*Comment Type:* T  *Comment Status:* A  *TX specs*

The ppm value for this PMD should be 20 ppm

**Suggested Remedy**

Replace TBD with 20

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

ACCEPT IN PRINCIPLE. Implement suggest remedy with editorial license.

---

**Cl 187 SC 187.5.2 P501 L8 # 110**

Huber, Thomas  Nokia

*Comment Type:* T  *Comment Status:* A  *TX specs*

The ppm value for this PMD should be 20 ppm

**Suggested Remedy**

Replace TBD with 20

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

ACCEPT IN PRINCIPLE. Implement suggest remedy with editorial license.
### Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

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

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<td>187.6</td>
<td>503</td>
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<td>A</td>
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