Cl **180** *SC* **180.7.1** *P* **438** *L* **44** # 20488

Kimber, Mark Semtech

Comment Type **TR** *Comment Status* **R** *(Optical) Ceq*

Over equalizing transmitters can cause BER floor issues as shown in kimber_3dj_01a_2505. Keeping Ceq > 1 (0dB) helps to prevent Tx peaking.

SuggestedRemedy

Add additional specification line after TECQ specification.
Noise Enhancement Factor, Ceq (min) 1

Response *Response Status* **U**

REJECT.
Resolve using the response to comment #491.

Cl **181** *SC* **181.7.1** *P* **462** *L* **26** # 20489

Kimber, Mark Semtech

Comment Type **TR** *Comment Status* **R** *(Optical) Ceq*

Over equalizing transmitters can cause BER floor issues as shown in kimber_3dj_01a_2505. Keeping Ceq > 1 (0dB) helps to prevent Tx peaking.

SuggestedRemedy

Add additional specification line after TECQ specification.
Noise Enhancement Factor, Ceq (min) 1

Response *Response Status* **U**

REJECT.
Resolve using the response to comment #491.

Cl **182** *SC* **182.7.1** *P* **487** *L* **9** # 20490

Kimber, Mark Semtech

Comment Type **TR** *Comment Status* **R** *(Optical) Ceq*

Over equalizing transmitters can cause BER floor issues as shown in kimber_3dj_01a_2505. Keeping Ceq > 1 (0dB) helps to prevent Tx peaking.

SuggestedRemedy

Add additional specification line after TECQ specification.
Noise Enhancement Factor, Ceq (min) 1

Response *Response Status* **U**

REJECT.
Resolve using the response to comment #491.

Cl **183** *SC* **183.7.1** *P* **512** *L* **37** # 20491

Kimber, Mark Semtech

Comment Type **TR** *Comment Status* **R** *(Optical) Ceq*

Over equalizing transmitters can cause BER floor issues as shown in kimber_3dj_01a_2505. Keeping Ceq > 1 (0dB) helps to prevent Tx peaking.

SuggestedRemedy

Add additional specification line after TECQ specification.
Noise Enhancement Factor, Ceq (min) 1

Response *Response Status* **U**

REJECT.

Given the changes to the reference equalizer as noted in comment #384 , there is no consensus to make a change at this time. There is more than one candidate method to address the comment.

Further work using the new reference receiver is encouraged.

Cl **170** *SC* **170.4.3** *P* **207** *L* **7** # 20684

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *(Logic) (bucket2p)*

There should be major options for MAC rate, as in 81.5.2.3 and 171.9.3

SuggestedRemedy

Split this item into two

Response *Response Status* **U**

REJECT.
The current approach in 170.4.3 (800GbE and 1.6TbE) is consistent with subclause 117.5.3 (200GbE and 400GbE). The comment points out that 81.5.2.3 also defines two major options for the different MAC rates (40GbE and 100GbE) in a slightly different format, but an updated format was used for Clause 117 which is now being carried forward for PICS in 170.4.3.

Cl **175** *SC* **175.2.4.6.1** *P* **266** *L* **10** # 20694

Dawe, Piers Nvidia

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

This is a specification, not a school lecture. am_x is not an example, we are defining its name here. 179 linear fit has "define", which is better although we don't usually write in the imperative.

SuggestedRemedy

Change
Let am_x<119:0> be the alignment marker for PCS lane x, x=0 to 15, where bit 0 is the first bit transmitted.
to
The alignment marker for PCS lane x, where x=0 to 15, is defined as am_x<119:0>. Bit 0 is the first bit transmitted.
Make similar changes elsewhere.

Response *Response Status* **U**

REJECT.

This wording is identical to wording in other PCS subclauses describing AM insertion such as 91.5.2.6, 119.2.4.4.1, 119.2.4.4.2, 134.5.2.6, 152.5.3.6, and 161.5.2.6.1. There are many examples of the phrasing "Let <some variable> be or represent or equal something" throughout the base standard and amendments.

Cl **177** *SC* **177.4.5** *P* **333** *L* **20** # 20699

Dawe, Piers Nvidia

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

x

SuggestedRemedy

Define

Response *Response Status* **U**

REJECT.
X, when used as the variable in a polynomial, is not defined in other clauses. This is common knowledge to implementers.

Cl **177** *SC* **177.4.5** *P* **333** *L* **25** # 20701

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *(Logic) (bucket2p)*

MSB

SuggestedRemedy

Define

Response *Response Status* **U**

REJECT.

MSB is defined in 1.5 and is used across the document. Although Galois field arithmetic has no mathematical MSB or LSB, they must be defined to ensure a correct implementation. For example, the order of the bits (MSB first or LSB first) impacts the syndrome calculation when implemeted as a shift register.

Cl **177** *SC* **177.4.5** *P* **334** *L* **1** # 20704

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *(Logic) matrix math*

^-1

SuggestedRemedy

Define

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Add definition for "^-1" as: "the superscript "-1" denotes a matrix inversion operator."

Each element is 1x8 with 8 elements that results in a square matrix. So an inverse operation is appropiate.

Implement with editorial license.

Cl **178** *SC* **178.9.2.4** *P* **364** *L* **34** # 20710

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucketp) Tx N_v*

Nv = 400 ! That's ludicrously rare, 4^400 is 7e240. 100 is enough

SuggestedRemedy

Change Nv to 100 wherever it is 400 in this draft

Response *Response Status* **U**

REJECT.
The pulse response length is intended to measure the steady-state voltage, which may have a long settling time. Limiting the measurement length does not serve any purpose and may cause test fixture dependence.
The probability argument in the comment is irrelevant since in practice the transmit equalizer will likely not be in preset 1 anyway, and in that case v_f will never be encountered.
The comment lacks justification to support the suggested remedy.

Cl **178** *SC* **178.10.1** *P* **371** *L* **15** # 20712

Dawe, Piers Nvidia

Comment Type **ER** *Comment Status* **R** *I) (bucketp) COM parameters*

Indices that look like exponents, should be subscripts

SuggestedRemedy

Change C_d^(1) to C_d1 or Cd1, and so on

Response *Response Status* **U**

REJECT.

Resolve using the response to comment #378.

Cl **178** *SC* **178.10.1** *P* **372** *L* **46** # 20714

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucketp) Jitter*

With a new COM, we can break away from old mistakes from the 8B/10B days. OIF did this years ago.

SuggestedRemedy

Change "Random jitter" to "Gaussian jitter", and sigma_RJ to sigma_GJ

Response *Response Status* **U**

REJECT.
"Gaussian jitter" appears in only 3 places in 802.3 and is never defined. The first instance is in 48B.1.2 which is titled "Random Jitter".
The suggested remedy deviates from established 802.3 terminology and would cause confusion, since the parameter sigma_RJ is used in multiple previous clauses.

There is no consensus to make the suggested change.

Cl **178** *SC* **178.10.1** *P* **372** *L* **46** # 20715

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucketp) Jitter*

Unrealistic jitter values

SuggestedRemedy

"RJ" should be increased and D-D jitter should be reduced

Response *Response Status* **U**

REJECT.

The suggested remedy provided in the comment lacks specific values to implement them.

Cl **180** *SC* **180.9.5** *P* **447** *L* **24** # 20721

Dawe, Piers Nvidia

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

4.56 x 10^-4 and the related Q t value (see 121.8.5.3) is 3.428
-> Qt = 3.846, 1 dBe better "SNR" (but doesn't change xECQ by that much). (implied 9e-5 but that doesn't matter). do this less for SRS and URS. 10*log10(3.846/3.428) = 0.5

SuggestedRemedy

Change Qt to 3.846, 1 dBe better "SNR" (but doesn't change xECQ by that much). (implied 9e-5 but that doesn't matter). Don't change Qt for for SRS and URS. FYI 10*log10(3.846/3.428) = 0.5

Response *Response Status* **U**

REJECT.

There is some agreement that further work is needed.

There is no consensus to make the proposed changes.

Cl **179** *SC* **179.9.4.6.1** *P* **402** *L* **1** # 20738

Dawe, Piers Nvidia

Comment Type **ER** *Comment Status* **R** *(Electrical) (bucketp) jitter*

The standard should be written in English. The three-pronged magnet is pretentious, unfamiliar and unnecessary.

SuggestedRemedy

Change to: For each transition I in the set A:

Response *Response Status* **U**

REJECT.
The comment refers to the mathematical symbol ?.
This symbol appears 77 times in IEEE Std 802.3-2022, with instances spanning clause 21 to clause 144. Readers are assumed to be familiar with it. In case of doubt, It is defined in Table 21-1 as "Indicates membership".

There is no consensus to make the change.

Cl **179** *SC* **179.9.4.6** *P* **401** *L* **28** # 20741

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucketp) Jitter*

Dud jitter method. Turning off aggressor lanes is desperate

SuggestedRemedy

Don't attempt to isolate jitter

Response *Response Status* **U**

REJECT.

The suggested remedy does not provide sufficient detail to implement.

Cl **179** *SC* **179.9.4.7** *P* **403** *L* **5** # 20743

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *(Electrical) (bucketp) ERL*

mating interface discontinuity - ambiguous and not defined.

SuggestedRemedy

Clarify what this means

Response *Response Status* **U**

REJECT.
The existing text exists since D1.2 and originates from the response to comment #199 against D1.1. This response was a result of discussion in the CRG with consensus on the wording "excluding the mating interface discontinuity". See <https://www.ieee802.org/3/dj/comments/D1p1/8023dj_D1p1_comments_final_clause.pdf#page=77>.

There may be room for improvement of the wording, but the suggested remedy does not provide sufficient detail to implement. Additional work on this topic is encouraged.

Cl **180** *SC* **180.7.1** *P* **466** *L* **15** # 22223

Dawe, Piers Nvidia

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

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

SuggestedRemedy

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

Response *Response Status* **U**

REJECT.

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

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

Cl **180** *SC* **180.9.9** *P* **485** *L* **41** # 22225

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *Tx FRx (O)*

The FEC bin limits have been revised to address impossible test times, but still they are very far from consistent with the project objective "BER of better than or equal to 10^-13 at the MAC/PLS service interface (or the frame loss ratio
equivalent)". If the FEC bin curve has half the theoretical gradient, bin 9 at 3.5e-13 might correspond to bin 16 at 1e-27, which is less than the age of the universe but (if my quick calculation is right) corersponds to a bad FEC block every 100 years on a million-link network - far beyond the lifetime of the equipment.

SuggestedRemedy

Rescale the x axis so that the last bin limit >3.5e-13 is bin 11, giving a BER equivalent substantially better than OIF's 1e-15 target.
Consider tightening the 1e-13 objective.

Response *Response Status* **U**

REJECT.

The comment does not provide sufficient justification to support the suggested remedy.

This comment is related to comment #155.

There is no consensus to make a change at this time.

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **8** # 22226

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *Tx FRx (CO)*

Test receivers are usually well specified but the definition of the "functional receiver" is so loose that this test has very limited value. For example, without any control of the jitter tolerance spectrum, a bad transmitter matched with a high-jitter-bandwidth receiver will pass when it shouldn't. For another example, a "functional receiver" could tolerate mis-emphasised signals at the borderline of what TECQ and overshoot specs catch. For a third, the receiver does not need to achieve 3.5e-13 in bin 9 under any condition, so a good transmitter matched with an unknown receiver can fail when both, and the link they make, are compliant and good. The test cannot distinguish between transmitter and receiver; either can have memory effects. It only tells is if a pair "play nicely" with each other.
We moved away from a line-rate receiver (TDP) to an oscilloscope (TxVEC -> TDEC -> T(D)ECQ and T(D)ECQ_CER) in 2014 (802.3bm) because the scope has very little memory effect and it is well calibrated. That reasoning is still valid.
This "functional receiver" test is not suitable for compliance but could be developed to provide information about transmitter-receiver pairs to build an interop matrix (which is not the 802.3 way).

SuggestedRemedy

Move the method into an informative annex as a diagnostic of interest to network operators.
Remove the rows in the optical transmitter spec tables.
Plug some of the gaping holes in the "functional receiver" definition.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Add an editor's note as follows:
"Note: The method defined in this subclause and its validation is a work in progress and in its current form needs to improve. Further contributions in this regard are encouraged."

Cl **180** *SC* **180.9.6.4** *P* **480** *L* # 22227

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *TDECQ, DFE (CO)*

Pulse shape of DFE feedback signal

SuggestedRemedy

Needs to be slowed down to make TDECQ respond consistently to jitter

Response *Response Status* **U**

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

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **42** # 22229

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *Tx FRx (O)*

"Test_SMF_power_budget loss and penalty are zero": what is this? Is Test_SMF_power_budget a loss and penalty? Is Test_SMF_power_budget loss zero; if so why is there an equation for it?

SuggestedRemedy

Delete

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #194.

Cl **180** *SC* **180.9.9.1** *P* **486** *L* **12** # 22230

Dawe, Piers Nvidia

Comment Type **ER** *Comment Status* **R** *Tx FRx (O)*

This section is quite involved with no introduction of what it is trying to do. It puts far too much burden on the reader's patience and reverse engineering skills.

SuggestedRemedy

Explain what the intention is. Show the various items adding and subtracting in a diagram.

Response *Response Status* **U**

REJECT.

The suggested remedy does not provide sufficient detail to implement.

Future work to develop a diagram to address the concern is encouraged.

Cl **180** *SC* **180.9.6.3** *P* **477** *L* **37** # 22231

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *tap limit (O)*

D2.0 comments 448, 489 and 491 points out that over equalizing transmitters can cause BER floor issues as shown in kimber_3dj_01a_2505, and proposes adding aspecification line, Noise Enhancement Factor, Ceq (min) 1.

SuggestedRemedy

As an explicit tap weight limit is easier to implement in the TDECQ optimizer than a Ceq limit - in Table 180-16, increase main tap coefficient limit from 0.8 to 0.95.

Response *Response Status* **U**

REJECT.

The current tap limit was adopted in D2.2 based on the data brought to the CRG.

The response to D2.2 comment #313 was:
[The following presentation was reviewed
https://www.ieee802.org/3/dj/public/25_09/rodes_3dj_01a_2509.pdf
In Table 180-15, for Main tap coefficient limit minimum value change from "0.9" to "0.8".
Apply same change to 181, 182, and 183. With editorial license.]

Changing the main cursor limit needs further study on its relation with the DFE and overshoot limit.

There is no consensus to make a change at this time.