Cl 82 SC 82.2.8 P 125 L 25 # 1
Seung-Hwan, Kim ETRI
Comment Type E Comment Status R
Spelling: Should be change 'de-skew' to 'deskew' for consistency.
SuggestedRemedy
Response Response Status C
REJECT.

Cl 82 SC 82.2.4.4 P 122 L 725 # 2
Seung-Hwan, Kim ETRI
Comment Type T Comment Status A
At Data Block Formats and Control Block Formats:
The slash('/') is used to separate and represent two 4 bytes transfer in 10GBase-R, but in 40G/100GBase-R there is no need slash('/') between 8 bytes.
SuggestedRemedy
Response Response Status C
ACCEPT.
Also covered by #202

Cl 82 SC 82.2.17.2.2 P 131 L 18 # 3
Seung-Hwan, Kim ETRI
Comment Type T Comment Status A
Should be change 'rx_raw<63>' to 'rx_raw<71>'.
SuggestedRemedy
Response Response Status C
ACCEPT.
change 'rx_raw<63>' to 'rx_raw<71>'. Dupe of #527

Cl 82 SC 82.2.18.2 P 134 L 41 # 4
Seung-Hwan, Kim ETRI
Comment Type T Comment Status A
Should be change 'per 31.25' to 'per 31.25 us'.
SuggestedRemedy
Response Response Status C
ACCEPT.

Cl 82 SC 82.2.17.3 P 137 L 30 # 5
Seung-Hwan, Kim ETRI
Comment Type T Comment Status A
Should be change 'am_cnt = 2 *' to 'am_cnt = 4 *'.
SuggestedRemedy
Response Response Status C
REJECT.
If I understand the comment correctly, the am_cnt = 2 * is from the VALID_AM to 2_GOOD state transition. This should be 2, only two good markers in a row gets in you lock.

Cl 82 SC 82.2.17.3 P 137 L 33 # 6
Seung-Hwan, Kim ETRI
Comment Type T Comment Status A
Should be change '2_GOOD' to '4_GOOD'.
SuggestedRemedy
Response Response Status C
REJECT.
This should remain 2_GOOD. The baseline has two good markers to get in lock.
IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

Task force Review

Cl 82 SC 82.2.4.4 P 122 L # 7
Wong, Don Cisco Systems

Comment Type ER Comment Status A

Figure 82-5

For BlockTypeField 0xb4, 0xcc, 0xd2 & 0xe1, missing one more "single bit" field (marked by thin rectangle).

SuggestedRemedy

Add "thin rectangle" for BlockTypeField 0xb4, 0xcc, 0xd2 & 0xe1.

Response Response Status C

ACCEPT.

[Added missing subclause number 82.2.4.4 to subclause field]

Will add the appropriate rectangles.

Cl 82 SC 82.2.17.3 P 137 L 23 # 8
Shafai, Farhad Sarance Technologies

Comment Type TR Comment Status A

The state diagram in figure 152-12 shows that after am_lock is achieved, if there are 4 !am_valid conditions in a fixed window of 4 alignment marker periods, then am_lock is set to false. Because the window is fixed in time, it is possible that up to 6 !am_valid conditions may occur and the state machine will remain in lock (i.e. 3 !am_valid conditions in one window followed immediately by 3 more !am_valid conditions in the next window).

SuggestedRemedy

Suggested remedy is to make the window "sliding". That is, if there are four consecutive !am_valid conditions over any four align maker periods, then the am_lock is set to false.

Response Response Status C

ACCEPT.

Make the appropriate changes to the state machine to have a sliding window.

Apparently the commenter has commented using Draft 0.9 with old clause numbers. The clause number and subclause fields have been corrected to 82 to import into the comment database. Same remedy as 191
The definition of 100GBASE-ER4 "IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes, extended long reach, single mode fiber." This implies that the fibre alone determines the reach.

Suggested Remedy
Re-word as: "100GBASE-ER4: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes on single mode fiber with extended reach. (See IEEE 802.3, Clause 88.)"

Similarly re-word 100GBASE-LR4 definition to:
"100GBASE-LR4: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes on single mode fiber with long reach. (See IEEE 802.3, Clause 88.)"

Response
ACCEP IN PRINCIPLE.

Add comma after fiber in suggested remedy:
"100GBASE-LR4: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes on single mode fiber, with extended reach. (See IEEE 802.3, Clause 88.)"

The definition of virtual lanes is awkwardly worded:
"Virtual Lane: In 40GBASE-R and 100GBASE-R, the PCS distributes encoded data to multiple logical lanes, these logical lanes are called virtual lanes. They are called virtual lanes since one or more of PCS lanes can be multiplexed and carried on a physical lane together at the PMA interface."

Suggested Remedy
Re-word as:
"Virtual Lane: In 40GBASE-R and 100GBASE-R, the PCS distributes encoded data to multiple logical lanes, these logical lanes are called virtual lanes since one or more of the PCS lanes can be multiplexed and carried on a physical lane together at the PMA interface."

Response
ACCEP IN PRINCIPLE.

Overtaken by events. See response to comment #334.

Change Virtual Lane definition to PCS Lane (PCSL) and also add abbreviation to 1.5
Response

The modified definition for "1.4.311 RMS spectral width" is shown in italic font. The font should match the base document.

Suggested Remedy

Change the font of the modified definition for RMS spectral width to match the base document

ACCEPT IN PRINCIPLE.

Change font style to normal from italic and make the subclause title 1.4.311 to bold.

Response

The abbreviation for CAUI is expanded as "100Gb/s Attachment Unit Interface" but the other abbreviations use "Gigabit" rather than "Gb/s"

Suggested Remedy

Change to "100 Gigabit Attachment Unit Interface"

ACCEPT.

Response

The abbreviation OPU3 is expanded as "Optical Payload Unit 3" but OPU is defined in ITU-T G.709 as "Optical channel Payload Unit"

Suggested Remedy

Change to "Optical channel Payload Unit 3"

ACCEPT.

Response

Underneath the new note 7 there is a box containing "WARNING Any deviation from the above specified values may affect proper operation of the network." This warning box is already present in the base standard beneath the notes to Table 4-2. Is this wording to be added again just part way through the notes? If so, this has the effect of effectively removing the warning from all of the notes except new note 7 and the last one.

Suggested Remedy

Remove the warning box from below the new note 7

ACCEPT.

Response

The editing instruction says "Insert 45.2.1.4.7 and 45.2.1.4.8 as follows:" but the inserted clauses are 45.2.1.4.8 and 45.2.1.4.9 (leaving room for 802.3av to insert 45.2.1.4.7)

Suggested Remedy

change the editing instruction to "Insert 45.2.1.4.8 and 45.2.1.4.9 as follows:"

ACCEPT.
Comment Type T  Comment Status A
The first sentence is modified to be "The PMA/PMD type of the PMA/PMD shall be selected using bits 4 through 0." However Table 45-7 uses bits 5 through 0
SuggestedRemedy
Change "using bits 4 through 0." to "using bits 5 through 0."
Response  Response Status C
ACCEPT.

Comment Type T  Comment Status A
The text "and the 40G/100G PMA/PMD extended ability register 2" has been added, but the register is now called just "40G/100G PMA/PMD extended ability register" in Table 45-12a
SuggestedRemedy
change added text from "and the 40G/100G PMA/PMD extended ability register 2" to "and the 40G/100G PMA/PMD extended ability register"
Response  Response Status C
ACCEPT IN PRINCIPLE.
Also change register number 1.12 to 1.13 in 45.2.1.12a

Comment Type T  Comment Status A
This states "A PMA/PMD shall ignore writes to the PMA/PMD type selection bits that select PMA/PMD types it has not advertised in the PMA/PMD status 2 register." However the PMA/PMD type is now advertised in three registers as per the preceeding text.
SuggestedRemedy
change "it has not advertised in the PMA/PMD status 2 register" to "it has not advertised"
Response  Response Status C
ACCEPT.

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editoral  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID
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</tr>
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<tbody>
<tr>
<td>25</td>
<td>TR</td>
<td>technical</td>
<td>A</td>
<td>T</td>
<td>Titles of 45.2.3.18a.4 through 45.2.3.18a.8 refer to the wrong bits and in 45.2.3.18a.4 &quot;bit 3.51.9&quot; should be &quot;bit 3.51.8&quot;</td>
<td>change titles of 45.2.3.18a.4 through 45.2.3.18a.8: from &quot;Lane 16 lock (3.51.9)&quot; to &quot;Lane 16 lock (3.51.8)&quot; from &quot;Lane 15 lock (3.51.3)&quot; to &quot;Lane 15 lock (3.51.7)&quot; from &quot;Lane 14 lock (3.51.2)&quot; to &quot;Lane 14 lock (3.51.6)&quot; from &quot;Lane 13 lock (3.51.1)&quot; to &quot;Lane 13 lock (3.51.5)&quot; from &quot;Lane 12 lock (3.51.0)&quot; to &quot;Lane 12 lock (3.51.4)&quot; and in 45.2.3.18a.4 change &quot;bit 3.51.9&quot; to &quot;bit 3.51.8&quot;</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>26</td>
<td>TR</td>
<td>technical</td>
<td>A</td>
<td>T</td>
<td>This refers to Table 45-98 but the new table is 45-99a also text contains &quot;Multi-lane BASE-R PCS alignment status register 2&quot; which should be &quot;Multi-lane BASE-R PCS alignment status register 4&quot;</td>
<td>Change reference to Table 45-99a Change &quot;Multi-lane BASE-R PCS alignment status register 2&quot; to &quot;Multi-lane BASE-R PCS alignment status register 4&quot; in 4 places</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>27</td>
<td>TR</td>
<td>technical</td>
<td>A</td>
<td>T</td>
<td>In 45.2.3.20a.1 through 45.2.3.20a.12 the text refers to &quot;bit 3.51.x&quot; which should be &quot;bit 3.53.x&quot;</td>
<td>Change &quot;bit 3.51.&quot; to &quot;bit 3.53.&quot; in 23 places and in 45.2.3.20a.4 change &quot;bit 3.51.9&quot; to &quot;bit 3.53.8&quot;</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>28</td>
<td>TR</td>
<td>technical</td>
<td>A</td>
<td>T</td>
<td>In Table 45-99a in the first column 3.50.x should be 3.53.x</td>
<td>Change &quot;3.50.0.&quot; to &quot;3.53.0.&quot; in 13 places</td>
<td>ACCEPT.</td>
</tr>
</tbody>
</table>

**Comment ID # 30**

Anslow, Peter
Nortel Networks

**Comment Type** | **Comment Status** | **Comment** | **Response Status** | **Response**
---|---|---|---|---
TR/technical | A | In Table 45-99a in the first column 3.50.x should be 3.53.x | ACCEPT. |
Cl  45  SC  45.2.3.20a.4  P  64  L  1  #  31
Anslow, Peter  Nortel Networks
Comment Type  T  Comment Status  A  
Titles of 45.2.3.20a.4 through 45.2.3.20a.8 refer to the wrong bits
SuggestedRemedy  
change titles of 45.2.3.20a.4 through 45.2.3.20a.8:
from "Lane 16 aligned (3.53.9)" to "Lane 16 aligned (3.53.8)"
from "Lane 15 aligned (3.53.3)" to "Lane 15 aligned (3.53.7)"
from "Lane 14 aligned (3.53.2)" to "Lane 14 aligned (3.53.6)"
from "Lane 13 aligned (3.53.1)" to "Lane 13 aligned (3.53.5)"
from "Lane 12 aligned (3.53.0)" to "Lane 12 aligned (3.53.4)"
Response  
Response Status  C  ACCEPT.

Cl  45  SC  45.2.7.12  P  66  L  17  #  32
Anslow, Peter  Nortel Networks
Comment Type  E  Comment Status  A  
In Table 45-142 bit 7.48.7 has been Reserved. However the whole row should be shown in underline font as it is new.
SuggestedRemedy  
Show whole row for bit 7.48.7 in underline font
Response  
Response Status  C  ACCEPT.

Cl  73  SC  73.10.1  P  75  L  22  #  54
Anslow, Peter  Nortel Networks
Comment Type  T  Comment Status  A  
The PD definition has changed from "represents all of the following that are present: 1000BASE-KX PMA, 10GBASE-CX4, 10GBASE-KR PMA, 10GBASE-CR4, 100GBASE-CR10." where some have PMA afterwards and some don't
SuggestedRemedy  
Change to "represents all of the following that are present: 1000BASE-KX PMA, 10GBASE-CX4, 10GBASE-KK4 PMA, 10GBASE-KR PMA, 40GBASE-KR4, 40GBASE-CR4, 100GBASE-CR10 PMA."
Response  
Response Status  C  ACCEPT.

Cl  73  SC  73  P  73  L  5  #  33
Anslow, Peter  Nortel Networks
Comment Type  T  Comment Status  A  
Format of Note does not conform to style guide
SuggestedRemedy  
 Either change "Note that" to "NOTE-" to make the note informative or change the font of the note to "Text" (10 point) for normative text.
Response  
Response Status  C  ACCEPT IN PRINCIPLE.

Cl  80  SC  80.1.3  P  86  L  53  #  35
Anslow, Peter  Nortel Networks
Comment Type  E  Comment Status  A  
item e) currently reads "The PMD Service Interface, which, when physically implemented at an observable interconnection port, uses a 4 or 10 lane data path as specified in Clause 86."
To match the other items the name PPI should be included.
SuggestedRemedy  
change "when physically implemented at an observable interconnection port" to "when physically implemented as PPI (Parrell Physical Interface) at an observable interconnection port"
Response  
Response Status  C  ACCEPT.
Comment Type  E  Comment Status  A
This says "The letter C in the port type (e.g. 40GBASE-CR4 or 100GBASE-CR10) represents a physical medium of shielded balanced copper cabling assembly of at least 10 m in length.". But the physical medium is up to 10 m in length. It is the PMD that is capable of at least 10 m.

Suggested Remedy
Either change "at least" to "up to" in 5 places in this paragraph, or change "represents a physical" to "represents a port capable of operation over a physical" in 5 places

Response  Response Status  C
ACCEPT IN PRINCIPLE.

see response to comment 466

Comment Type  E  Comment Status  A
This contains "implementations and the Table 80-1 specifies" which reads awkwardly.

Suggested Remedy
"implementations and the Table 80-1 specifies" to "implementations. Table 80-1 specifies"

Response  Response Status  C
ACCEPT.

[corrected page number from 87 to 88]
Comment Type E Comment Status R
The title of 82.1.3.3 is "Physical Medium Attachment (PMD) sublayer". This should be
"Physical Medium Dependent (PMD) sublayer"
Suggested Remedy
Change "Physical Medium Attachment (PMD) sublayer" to "Physical Medium Dependent
(PMD) sublayer"
Response Response Status C
REJECT.
Subclause 82.1.3.3 is to be deleted.

Comment Type T Comment Status A
In clause 81.3.4.3 there is a simple description of the Link Fault State Diagram. This says
"The variable link_fault is set to indicate the value of a received Sequence ordered_set
when four fault_sequences containing the same fault value have been received with each
pair of fault_sequences separated by less than 128 columns and no intervening
fault_sequences of a different fault value."
Simple descriptions for Figure 82-12-PCS lane lock state diagram, Figure 82-13-PCS
alignment marker lock state diagram and Figure 82-15-BER monitor state diagram alon
the lines of that above would be very helpful.
Suggested Remedy
Add simple descriptions of the state diagrams for Figures 82-12, 82-13 and 82-15
Response Response Status C
ACCEPT.
Add simple text descriptions of the PCS state diagrams.
The service primitives in clause 84 are not in the same format (e.g., PMD_UNITDATA.request<0:3>) as for clauses 85 through 88.

Suggested Remedy
- Change the format of the service primitives in clause 84 to be in the same format (e.g., PMD_UNITDATA.request<0:3>) as for clauses 85 through 88.

Response
- The service interface definition will be reconciled to what will be adopted for the other clauses.

This says "Upon completion of training, SIGNAL_DETECT shall be set to OK" but it is not clear that training must be completed on all lanes. The same issue for clause 85.7.4.

Suggested Remedy
- Change "Upon completion of training, SIGNAL_DETECT shall be set to OK" to "Upon completion of training on all lanes, SIGNAL_DETECT shall be set to OK"
- Do the same in clause 85.7.4

Response
- Accept

Table 85-1 Note b contains two instances of "XLGMII" which should be "CGMII".

Suggested Remedy
- Change "XLGMII" to "CGMII" in two places

Response
- Accept
The format of the messages PMD_UNITDATA.request and PMD_UNITDATA.indication in clauses 85.72 and 85.7.3 do not match the definitions in 85.2.

**Suggested Remedy**
- Change "message PMD_UNITDATA.request (tx_bit<0:3>)" to "messages PMD_UNITDATA.request<0:3>" in two places.
- Change "message PMD_UNITDATA.request(tx_bit<0:9>)" to "messages PMD_UNITDATA.request<0:9>" in two places (Note, the first one has 0:3 where it should be 0:9).
- Change "message PMD_UNITDATA.indication (rx_bit<0:3>)" to "messages PMD_UNITDATA.indication<0:3>" in two places (clause 85.7.3)
- Change "message PMD_UNITDATA.indication (rx_bit<0:9>)" to "messages PMD_UNITDATA.indication<0:9>" in two places (clause 85.7.3)

**Response**
- ACCEPT IN PRINCIPLE.
- See response to clause 80 comment #620

Clause 85.7.7 is about lane-by-lane transmit disable function, but the text discusses "Global_PMD_transmit_disable function". This needs to be changed along the lines of clause 86.4.8.

**Suggested Remedy**
- Change the first two sentences from "The Global_PMD_transmit_disable function is optional. It allows the electrical transmitters in each lane to be selectively disabled." to "The PMD_transmit_disable_i function (where i represents the lane number in the range 0:3 or 0:9) is optional and allows the optical transmitter in each lane to be selectively disabled."

- in item a) change "the Global_PMD_transmit_disable variable" to "a PMD_transmit_disable_i variable and change "the transmitter such that" to "the transmitter associated with that variable such that"

- in item b) change "may turn off the electrical transmitter." to "may set each PMD_transmit_disable_i to ONE, turning off the electrical transmitter in each lane."

- in item c) change "Global_PMD_transmit_disable" to "PMD_transmit_disable_i"

**Response**
- ACCEPT.

The nominal unit interval is given in Table 85-4 as "96.9697" but in clause 83A it is given as "96.96969697". Since the UI is the same for these two clauses, the number of significant figures quoted should be the same. Considering the 100 ppm tolerance, somewhere between these two seems appropriate.

**Suggested Remedy**
- Change all occurrences of "96.9697" and "96.96969697" to "96.969697" (four places in clause 85 and three places in clause 83A)

**Response**
- ACCEPT IN PRINCIPLE.
- Change all occurrences of "96.9697" and "96.96969697" to "96.969697"

Note: if applicable three places in clause 83A

The says "with the exception of the transmitter specified in 85.8.3.3." but 85.8.3.3 is the "Signaling speed range" and does not specify a transmitter.

**Suggested Remedy**
- Change this cross-reference to the intended subclause

**Response**
- ACCEPT IN PRINCIPLE.
- Suggested remedy

- Change: "with the exception of the transmitter specified in 85.8.3.3."

- To: "with the exception of the transmitter characteristics specified in 85.8.3.3."

Also see comment #144
<table>
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<th>Comment ID</th>
<th>Subclause</th>
<th>Comment</th>
<th>Response</th>
<th>Requested Change</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>#53</td>
<td>SC 85.11.1 P 191 L 43</td>
<td>This says &quot;between the PMD of 85.7.1 and&quot; but 85.7.1 is the link block diagram</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>change &quot;between the PMD of 85.7.1 and&quot; to &quot;between the PMD of 85.8 and&quot;</td>
<td>A</td>
</tr>
<tr>
<td>#54</td>
<td>SC 86.1 P 199 L 22</td>
<td>In Table 86-1 the abbreviation &quot;Gbd&quot; should be &quot;GBd&quot;</td>
<td>ACCEPT.</td>
<td>change &quot;Gbd&quot; to &quot;GBd&quot;</td>
<td>C</td>
</tr>
<tr>
<td>#55</td>
<td>SC 86.1 P 199 L 32</td>
<td>&quot;A signal with power in OMA and average power not within the ranges given cannot be compliant.&quot; However either condition makes the signal non-compliant so it should be &quot;or&quot; not &quot;and&quot;</td>
<td>ACCEPT.</td>
<td>change &quot;in OMA and average&quot; to &quot;in OMA or average&quot;</td>
<td>C</td>
</tr>
<tr>
<td>#56</td>
<td>SC 84.1 P 159 L 12</td>
<td>'40GBASE-KR' is wrong in the title of Table 84-1.</td>
<td>ACCEPT.</td>
<td>'40GBASE-KR' has to be replaced by '40GBASE-KR4'</td>
<td>C</td>
</tr>
</tbody>
</table>
Comment ID # 63
Sun Hyok, Chang
Electronics and Teleco

Comment Type T  Comment Status A
It is wrong that '10GBASE-KR' is written at line 14 of Table 84-1.

SuggestedRemedy
'10GBASE-KR' has to be replaced by '40GBASE-KR4'

Response  Response Status C
ACCEPT.

[added 84 to subclause number in comment]
Also see comment # 197

Comment ID # 64
Sun Hyok, Chang
Electronics and Teleco

Comment Type T  Comment Status A
'40GBASE-KR' is wrong in the title of Subclause 84.8.

SuggestedRemedy
'40GBASE-KR' has to be replaced by '40GBASE-KR4'

Response  Response Status C
ACCEPT.

[added 84 to subclause number in comment]

Comment ID # 68
Chung, Hwan Seok
ETRI

Comment Type T  Comment Status A
There are two types of description for MMF in D1.0 such as "multi mode fiber" and "multimode fiber". Across the entire document, "multimode fiber" was mostly used. So, to maintain consistency, it will be better to change "multi mode fiber" to "multimode fiber."

The change should be done in following lines.
Clause 1, page 23, line 21: multi mode fiber->multimode fiber
Clause 1, page 23, line 42: multi mode fiber->multimode fiber
Clause 80, page 85, line 31: multi mode fiber->multimode fiber
Clause 80, page 85, line 38: multi mode fiber->multimode fiber

SuggestedRemedy

Response  Response Status C
ACCEPT IN PRINCIPLE.

See response to comment # 519
In page 14, line 30, the title 40GBASE-KR should be changed to 40GBASE-KR4.

Suggested Remedy

ACCEPT IN PRINCIPLE.

Fix the paragraph heading in 84.8. (ToC will get updated)

"XLMII" is written at line 22 below Table 86-2.

Suggested Remedy

"XLMII" has to be replaced by 'XLGMII'

Response

ACCEPT.

Across the entire document D1.0, the usual description of signaling speed per lane (range) in table is 10.3125 ± 100 ppm. So, to maintain consistency, the signaling speed per lane in Table 83A-1 should be "10.3125 ± 100 ppm" not "10.3125 GBd ± 100 ppm". In addition, the ± sign should be changed to mathematical symbolic font style.

Suggested Remedy

ACCEPT.

"XLMII" is written at line 23 below Table 86-2.

Suggested Remedy

"XLMII" has to be replaced by 'XLGMII'

Response

ACCEPT.

In Table 87-6, I think 'Minimum range' is confusing expression. Because '2m to 10 km' is not 'minimum'.

Suggested Remedy

'Operating range' is easier to be understood. 'Minimum range' has to be replaced by 'Operating range'.

Response

ACCEPT IN PRINCIPLE.

Change "Minimum range" to "Required operating range" in Table 87-6. Also change "operating at 12.5 km meets the minimum range requirement of 2 m to 10 km" to "operating at 12.5 km meets the operating range requirement of 2 m to 10 km" on page 230 line 43.
In Table 88-6, I think "Minimum range" is confusing expression. Because '2m to 10 km' is not 'minimum'.

SuggestedRemedy
"Operating range" is easier to be understood. 'Minimum range' has to be replaced by 'Operating range'.

Response
ACCEPT IN PRINCIPLE.

[Subclause changed from 6 to 88.6]

Change "Minimum range" to "Required operating range" in Table 88-6.
Also change "operating at 12.5 km meets the minimum range requirement of 2 m to 10 km" to "operating at 12.5 km meets the operating range requirement of 2 m to 10 km" on page 250 line 35.

See also comments #77 and #79

Comment ID # 82
**Comment ID** 83

**Comment Type** T

**Comment Status** A

**Comment**

A comment has been submitted for Table 88-7 and 88-8 (10GBASE-LR4 transmit characteristics) to increase the max optical power by 0.5dB. The purpose of this comment for Table 88-12 is to align the 10GBASE-ER spec (40km) with the changes proposed to the 10GBASE-LR (10km) spec. This will make the 40km spec consistent with the intent of 802.3ba when it adopted it as baseline, specifically that it have interoperable overload characteristics with the 10km spec.

**Suggested Remedy**

The following three changes are proposed for table 88-12-100GBASE-ER4 receive characteristics:

- **Receive power, per lane OMA (max):** 4.0dBm => 4.5dBm
- **Average receive power, per lane (max):** 4dBm => 4.5dB
- **Damage threshold:** 5.0dBm -> 5.5dBm

The SOA overload data presented in 802.3ba during this year fully supports increasing overload by 0.5dB.

**Response**

ACCEPT.

---

**Comment ID** 84

**Comment Type** T

**Comment Status** A

**Comment**

The range between Max and Min transmitter launch OMA seems to be too narrow to have good yield. The root cause is located at the low launch OMA max and the low receive OMA sensitivity. Several numbers in Table.88-7 and 88-8 need to be modified.

A full justification is given in the attached file Oomori_01_1108.pdf

**Suggested Remedy**

1) Change Transmitter launch OMA max from 4.0dBm to 4.5dBm
2) Change Transmitter average launch power (max) from 4.0dBm to 4.5dBm
3) Change Receiver OMA sensitivity from -8.1dBm to -8.6dBm

Other parameters are required to change as a consequence of this. For a full list see slide 13 of attached file Oomori_01_1108.pdf

**Response**

ACCEPT.

---

**Comment ID** 85

**Comment Type** E

**Comment Status** A

**Comment**

“at least 100m”

**Suggested Remedy**

“at least 100m”

**Response**

ACCEPT.
Comment Type  ER  Comment Status  R
Bit 3.23.3 advertises the ability to test a PRBS9 pattern.
However there is no corresponding "PRBS9 receive test-pattern enable" in Table 45-94.

SuggestedRemedy
I dont think there was any intention to add PRBS9 pattern verification.
There is no mention of it in the PMA clause either.
Remove Bit 3.23.3

Response  Response Status  C
REJECT.

[Editor's note: corrected subclause number field from 45-90 to 45.2.3.11]
The ability and control for PRBS9 was defined in 802.3aq and cannot be deleted.

Comment Type  ER  Comment Status  A
"The single lane PHY marks every 8th 64B/66B block"
is not strictly true. It also always marks the last block in a frame (+7!)
This is repeated on line 31 on the same page

SuggestedRemedy
Change to
"The single lane PHY marks every 8th and the last 64B/66B word in an FEC block"or similar. The four lane wording may need the same change.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

[corrected subclause number in comment]
See remedy to comment # 227
Whilst defining the operation of the PRBS error counter for the PMA, the deficiencies of the current 10GBASE-R function should be considered. The self-synchronous descrambling of the PRBS31 sequence shown in Figure 49-11 is both inaccurate and costly to implement.

1) The error count is 3x the number of received error bits only if errored bits do not appear 3 or 28 bits apart (the PRBS tap separation). So in bursty environments the count will not be 3x the number of errors.

2) Compliance with the Figure 49-11 requires the ability to increment a counter at 10Ghz. Any practical implementation will have to be implemented in parallel and increment a counter at a lower rate (create a backlog of increments and do them whilst no errors are received). Absolute compliance to Figure 49-11 at high bits rates is not practical.

Aggregation of these counters to 40/100G will only compound these issues

SuggestedRemedy

Set an accuracy limit for the error counter eg indicate that the counter need only be bit accurate at error rates above say 1e-4, and for burst lengths of say less than 32bits

Response

REJECT.

[Changed subclause 6.7 to 83.6.7]

Presentations made so far were entirely reuse of PRBS31 from 10GBASE-R. Need a presentation to justify why this cannot be reused and why the proposed alternative approach would be more feasible and would provide equivalent verification of the lanes.

In Table 87-13, ‘DGD_max’ is represented to describe the PMD (polarization mode dispersion) specification. But ‘DGD_max’ is not sufficient to give the PMD specification of the fiber link. Parameter of P(DGD_tot > DGD_max) is the probability that a system DGD value, DGD_tot, exceeds DGD_max.

SuggestedRemedy

Parameter of P(DGD_tot > DGD_max) per each lane is needed in Table 87-13.

Response

REJECT.

See response to comment 94

802.3 specifies only the DGD_max that the system must tolerate for BER within specified limits. See clause 52.13. This is consistent with ITU specifications for optical systems (e.g. G.691, G.959.1). Different users are able to tolerate different probabilities of the actual DGD exceeding DGD_max, so it inappropriate to specify this value.

See also comments #92 and #93
In line 21, it is written that 'DGD_max is the maximum differential group delay that the system must tolerate'. It is wrong. 'DGD_max' is defined in the Method 2 of IEC 61282-3. 'DGD_max' is defined with P(DGD_tot > DGD_max), which is the probability that a system DGD value, DGD_tot, exceeds DGD_max. 'DGD_max' and P(DGD_tot > DGD_max) give the DGD specification of the fiber link.

SuggestedRemedy
The sentence 'DGD_max is the maximum differential group delay that the system must tolerate' is needed to be replaced by "DGD_max is defined in the Method 2 of IEC 61282-3".

Response
REJECT.

IEEE 802.3 has chosen to specify only the DGD_max that the system has to tolerate with the BER remaining within the specified limit. See 802.3 clause 52.13. This is also in line with ITU-T specifications for optical systems (e.g., G.691, G.959.1). Different users are able to tolerate different probabilities of the actual DGD exceeding DGD_max, so it inappropriate to specify this value.

See also comments #91 and #93

In Table 88-17, 'DGD_max' is represented to describe the PMD (polarization mode dispersion) specification. But 'DGD_max' is not sufficient to give the PMD specification of the fiber link. Parameter of P(DGD_tot > DGD_max) is needed (from the Method 2 of IEC 61282-3). P(DGD_tot > DGD_max) is the probability that a system DGD value, DGD_tot, exceeds DGD_max.

SuggestedRemedy
Parameter of P(DGD_tot > DGD_max) per each lane is needed in Table 88-17.

Response
REJECT.

Parameter "sub-layer" in clause 83 to keep consistency with other clauses.

SuggestedRemedy
ACCEPT.

See also comments #91, #92 and #93
Comment Type: E  Comment Status: A
Change "optionally provides data loopback" to "optionally provide data loopback".

Suggested Remedy

Response

Response Status: C
ACCEPT.

Comment Type: E  Comment Status: R
In Table 83-1 change "Logical output Lanes" to "Logical output lanes".

Suggested Remedy

Response

Response Status: C
REJECT.
Overtaken by events - table removed

Comment Type: T  Comment Status: A
Need to clarify "40GBASE-SR4 and 100GBASE-SR10 interfaces" in the following text.

"Note that electrical and timing specifications of the PMD service interface are defined only for 40GBASE-SR4 and 100GBASE-SR10 interfaces."

Suggested Remedy

Change "Note that electrical and timing specifications of the PMD service interface are defined only for 40GBASE-SR4 and 100GBASE-SR10 interfaces."

"Note that electrical and timing specifications of the PMD service interface are defined only for 40GBASE-SR4 and 100GBASE-SR10 PMDs."

Response

Response Status: C
ACCEPT.
The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 
Mtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s.
The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 
Mtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s.

I think Mtransfers/s should be Gtransfers/s.

Suggested Remedy

Change "The 40GBASE-R PCS has a nominal rate at the PMA service 
interface of 10.3125 Mtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Mtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s."

to

"The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Gtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Gtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s."

Response

ACCEPT.

[Changed subclause number 1.4 to 82.1.4]

Will correct this.
Comment ID # 103

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC 82.1.6</th>
<th>P 116</th>
<th>L 52</th>
<th># 103</th>
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<tbody>
<tr>
<td>Ebbers, Jonathan</td>
<td>IBM</td>
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<td></td>
</tr>
</tbody>
</table>

**Comment Type**: E  
**Comment Status**: A  
**Response**: C  
**Comment ID # 103**

- Figure 2

"ALIGNMENT LOCK LANE DESKEW" should be "ALIGNMENT LOCK LANE DESKEW".

**Suggested Remedy**

Change "ALIGNMENT LOCK LANE DESKEW" to "ALIGNMENT LOCK LANE DESKEW".

**Response**: ACCEPT.

[Changed subclause number 1.6 to 82.1.6]

---

Comment ID # 104

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC 81.3.1.1</th>
<th>P 100</th>
<th>L 53</th>
<th># 104</th>
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<tbody>
<tr>
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<td>IBM</td>
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</tr>
</tbody>
</table>

**Comment Type**: T  
**Comment Status**: R  
**Response**: C  
**Comment ID # 104**

- For 100G, are we really going to run with TX_CLK and RX_CLK at 1.56GHz? This seems like quite a frequency jump; I'm surprised no consideration was given to expanding the bus width from 4 bytes to 8 or 16. We typically time the cores with 200 ps of margin, but 1.56G only gives us a 640ps cycle time. I think even at 45nm this would be very tight to time.

**Suggested Remedy**

Clarify the frequency requirements or allow for a wider MII bus definition.

**Response**: REJECT.

[Changed subclause number from 3.1.1 to 81.3.1.1]

---

Comment ID # 105

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC 82.2.8</th>
<th>P 125</th>
<th>L 23</th>
<th># 105</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ebbers, Jonathan</td>
<td>IBM</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment Type**: T  
**Comment Status**: A  
**Response**: C  
**Comment ID # 105**

82.2.8 states that the alignment markers are inserted after 16383 66-bit blocks are transmitted. We assume this includes interrupting a data packet and not waiting until an IPG. Since we cannot possibly write over data, is this process handled at the same time and in the same way as clock compensation (idle/OSet insert/delete) in the async crossing? How can we be sure that the MII data presented to the PCS Transmitter will have enough excess bandwidth to allow for AM insertion and clock compensation?

**Suggested Remedy**

Provide a more explicit description of the relationship between alignment marker insertion and idle insertion/deletion. Provide a specific minimum inter-frame size for transmitted MII data (from the MAC or RS) to allow for proper AM insertion and +/- 100 PPM clock frequency compensation.

**Response**: ACCEPT IN PRINCIPLE.

[Changed subclause number 2.8 to 82.2.8]

The numbering in figure 82.8 shows that the markers interrupt the regular data. See folkens_01_0508 for calculations of sufficient space even with jumbo frames.

Add to the 1st paragraph of 82.2.5 a sentence indicating that there is more than sufficient IPG+ordered sets to delete to make room for alignment markers in addition to clock compensation and a sentence that the algorithm for IPG deletion is implementation dependent.

**Response**: ACCEPT IN PRINCIPLE.

[Changed subclause number from 2.8 to 82.2.8]

---

This is a logical interface. Implementation left up to the user.
The definition of test_am appears to be inadequate. As defined, test_am will be true once for every 66-bit block and TEST_AM will be entered very frequently, causing !am_valid to be the exit path from TEST_AM almost every time, causing the FSM to never reach the 2_GOOD state.

Suggested Remedy
Refine test_am's definition to be less like that of test_sh. After the first detection of a valid AM, test_am should be tied to a timer that counts down from 16383 before asserting the next test_am.

ACCEPT.
[Changed subclause number from Figure 13 to 82.2.17.3]
Agree, several other comments have also pointed this out. It will be fixed. Editorial license for how to fix state machine. Dup of 106

The title of this subclause is wrong. Also there is no need to mention the PMD and MDI here. All in all this is just adding confusion.

Suggested Remedy
Delete subclause 82.1.3.3.

ACCEPT. Overtaken by events, see comment 323

The sentence "The Reconciliation sublayer provides the same service interface to the PCS." does not make sense.

Suggested Remedy
Delete this sentence.

ACCEPT.

Reword first two paragraphs to be similar to subclause 84.7.4 for clarity.

Suggested Remedy
Change:
"The Global PMD signal detect function shall report to the PMD service interface, using the message PMD_SIGNAL.indication (SIGNAL_DETECT) for 40GBASE-CR4 and PMD_SIGNAL.indication (SIGNAL_DETECT) for 100GBASE-CR10, which is signaled continuously. SIGNAL_DETECT in 40GBASE-CR4 and 100GBASE-CR10 indicates the successful completion of the start-up protocol on all four or ten lanes."

"The Global PMD signal detect function shall continuously report the message PMD_SIGNAL.indication (SIGNAL_DETECT) to the PMD service interface. SIGNAL_DETECT, while normally intended to be an indicator of signal presence, is used by 40GBASECR4 and 100GBASE-CR10 to indicate the successful completion of the start-up protocol on each lane."

"The Global PMD signal detect function shall continuously report the message PMD_SIGNAL.indication (SIGNAL_DETECT) to the PMD service interface. SIGNAL_DETECT, while normally intended to be an indicator of signal presence, is used by 40GBASECR4 and 100GBASE-CR10 to indicate the successful completion of the start-up protocol on all lanes."

RESPONSE STATUS: C

Overtaken by events, see comment 323

There is no mention of alignment marker insertion in Figure 82-3

Suggested Remedy
Change "Block Distribution" to "Block Distribution and Alignment Marker Insertion"

ACCEPT IN PRINCIPLE.

Also in Figure 82-4 indicate "Lane Block Sync, Deskew and Alignment Marker Removal".
Comment Type: T  Comment Status: A
Redundant text. Isn't this paragraph just repeating what has already been said in 82.2.4.1, page 118 line 32?

Suggested Remedy
Consider deleting the redundant text from either 82.2.4.1 or 82.2.4.3.

Response  Response Status: C
ACCEPT.
delete the redundant text from 82.2.4.3

Comment Type: T  Comment Status: A
The PHYs need to be able to drive at least these distances while the media can be up to these distances.

Suggested Remedy
Consider changing "of at least" to "of up to at least" in three places
Also change "least" to "least" on line 21.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
see response to comment 466

Comment Type: T  Comment Status: A
This text is redundant as it repeats what is described in 80.1.4 Nomenclature. Also it does not mention 40GBASE-LR4 and 'terms' should be 'term'.

Suggested Remedy
Delete
The term 40GBASE-R refers to a specific family of Physical Layer implementations for 40 Gb/s such as 40GBASE-KR4, 40GBASE-CR4 and 40GBASE-SR4. The term 100GBASE-R refers to a specific family of Physical Layer implementations for 100 Gb/s such as 100GBASE-CR10, 100GBASE-SR10, 100GBASE-LR4 and 100GBASE-ER4.
All 40GBASE-R and 100GBASE-R PHY devices share a common PCS specification defined in Clause 82,

So that the text reads:
The term '40GBASE-R and 100GBASE-R' refers to a specific family of Physical Layer implementations based upon 64B/66B data coding method specified in Clause 82 and the PMA specification defined in Clause 83.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
see response to comment 466

Comment Type: T  Comment Status: A
OSI not ISO
Suggested Remedy
Change "ISO (IEEE)" to "OSI"

Response  Response Status: C
ACCEPT.
Change
This MII (like the original MII, GMII and XGMII) maximizes media independence by cleanly separating the Data Link and Physical Layers of the ISO (IEEE) seven-layer reference model
To:
This MII (like the original MII, GMII and XGMII) maximizes media independence by cleanly separating the Data Link and Physical Layers of the OSI seven-layer reference model
Cl 81 SC 81.3.4 P 108 L 17 # 115
Marris, Arthur Cadence
Comment Type T Comment Status A clause49
Most of the text and the state diagram in 81.3.4 has been copied verbatim from Clause 46.

SuggestedRemedy
Consider referencing sub clause 46.3.4 for link fault signalling rather than having a direct copy. Something along the lines of:

"Link fault signalling shall be implemented as described in 46.3.4. The four octet sequence ordered set shall start in lane 0 with the octets in lanes 4, 5, 6 and 7 set to 0x00."

Response Response Status C
ACCEPT IN PRINCIPLE.
Add a sentence to clause 81.3.4 describing the difference from 46.3.4, and remove duplication of state machine Figure 81-9.

Cl 80 SC 80.1.3 P 86 L 1 # 116
Marris, Arthur Cadence
Comment Type E Comment Status A
Punctuation
delete comma before and

SuggestedRemedy
Change "MAC, and" to "MAC and"

Response Response Status C
ACCEPT.

Cl 82 SC 82.1.1 P 113 L 12 # 120
Marris, Arthur Cadence
Comment Type E Comment Status A
grammar, independent needs to be an adverb.

SuggestedRemedy
change to 'independently'.

Response Response Status C
ACCEPT.
**Comment 121**

**Comment ID**: 121

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

**Clause 80.11 needs to be renumbered.**

**Suggested Remedy**

Clause 80.11 should be 80.6

**Response**  
**Response Status**: C  
**Accept**  
Overtaken by events. PICS defined in respective clauses.

---

**Comment 122**

**Comment ID**: 122

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

**PPI is not listed as a keyword.**

**Suggested Remedy**

Add PPI to Keywords.

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

---

**Comment 123**

**Comment ID**: 123

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

**Listing of Editorial Team and Officers is incomplete.**

**Suggested Remedy**

Complete list provided below.

**D'Ambrosia, John**  
**Force10 Networks**

- John D'Ambrosia  
  Task Force Chair
- Ilango Ganga  
  Task Force Editor-in-Chief,  
  Editor, Clauses 1, 4, 80, Annexes A, 4A
- Mark Gustlin  
  "Logic" Sub-task Force Chair  
  Editor, Clauses 81 & 82
- Chris DiMinico  
  "Cu" Sub-task Force Chair  
  Editor, Clause 85
- Pete Anslow  
  "Optical" Sub-task Force Chair  
  Editor, Clause 88
- Hugh Barrass  
  Editor, Clauses 30, 45, Annexes 30A, 30B
- Piers Dawe  
  Editor, Clause 86
- Jonathan King  
  Editor, Clause 87
- RyanLatchman  
  Editor, Annex 83A
- Arthur Marris  
  Editor, Clauses 69, 73, 74, 84, Annexes 69A, 69B
- Steve Trowbridge  
  Editor, Clause 83
- George Oulundsen  
  Task Force Secretary
IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

Response

Frank Chang
Task Force Web Master

Accept.

D'Ambrosia, John
Force10 Networks

Comment Type: E
Comment Status: A

Approval of standards is listed as 15 September 200x. Schedule for standard approval at June standards board meeting.

Suggested Remedy
Change "15 September 200x" to "xx June 2010"

Accept.

D'Ambrosia, John
Force10 Networks

Comment Type: E
Comment Status: A

The annex and the title of the annex are listed as separate entries in the ToC: Annex 30A - GDMO Specification for IEEE 802.3 Managed Object Classes
Annex 30B - GDMO and ASN.1 definitions for Management
Annex 69A - Interference Tolerance Testing
Annex 69B - Interconnect Characteristics
Annex 83A - 40 Gb/s Attachment Unit Interface (XLAUI) and 100 Gb/s Attachment Unit Interface (CAUI)

Suggested Remedy
in ToC list Annex # and title on same line

Accept in Principle.

Check and update formatting of Annex title or ToC as appropriate

Will update ToC template in the next release

D'Ambrosia, John
Force10 Networks

Comment Type: E
Comment Status: A

Clause 86.8.2 - Laser Safety does not show up in ToC. Not sure if this is related to the fact that in the bookmarks that 86.8.2 shows up as a subclause under 86.8.1.

Suggested Remedy
Correct ToC to show 86.8.2
Correct bookmark in pdf file

Accept.

Check and fix any paragraph heading formatting issue in 86.8.2
Comment Type E  Comment Status A
note states "Change Table 45-7 for 40Gb/s and 100 Gb/s PMA/PMD type selection," and then 45.2.1.6.1 is also noted to be changed for 40 Gb/s and 100 Gb/s PMA/PMD type selections. However, 45.2.1.1.3 states "When bits 5 through 2 are set to 0000 the use of a 10G PMA/PMD is selected. More specific selection is performed using the PMA/PMD control 2 register (Register 1.7)"

Suggested Remedy
modify 45.2.1.1.3 to state

"When bits 5 through 2 are set to 0000 the use of a >=10G PMA/PMD is selected. More specific selection is performed using the PMA/PMD control 2 register (Register 1.7)"

Response Response Status C
ACCEPT.

Comment Type E  Comment Status A
Bullet C is confusing in relation to what the actual functions in the PCS are, as the Tx PCS and Rx PCS seem to both be capable of adding / deleting idles.

Suggested Remedy
Replace bullet c with the following text -

Compensation through insertion or deletion of idles for any rate difference caused by the insertion or deletion of alignment markers due to any rate difference between the MII and PMA.

Response Response Status C
ACCEPT IN PRINCIPLE.

Comment Type E  Comment Status A
Change:
"Deleting (inserting) idles to compensate for the rate difference between the MAC and PMD due to the insertion (deletion) of alignment markers and due to any rate difference between the MII and PMD."

to:
"Compensation for any rate differences caused by the insertion or deletion of alignment markers or due to any rate difference between the MII and PMA through the insertion or deletion of idles."

Response Response Status C
ACCEPT.

Comment Type E  Comment Status A
Subclauses not numbered properly - 80.11 should be 80.6

Suggested Remedy
renumber 80.11 to 80.6

Response Response Status C
ACCEPT IN PRINCIPLE.

Comment Type E  Comment Status A
choice of wording

Suggested Remedy
 Reword
The purpose of the MII is to provide a simple and easy-to-implement logical interconnection between the Media Access Control (MAC) sublayer and the Physical Layer (PHY). The MII is not intended to be electrically instantiated, rather it can logically connect layers within a device.

The MII is an optional logical interface between the Media Access Control (MAC) sublayer and the Physical Layer (PHY).

Response Response Status C
ACCEPT.

Comment Type E  Comment Status A
wording is confusing, as it implies that the two pcs's use two interfaces.

Suggested Remedy
Reword
There are two interfaces employed by the 40GBASE-R and 100GBASE-R PCSs.

to
There is one distinct interface employed for each rate of PCS.

Response Response Status C
ACCEPT.
Comment Type: E  Comment Status: A
Use of "MII" is ambiguous.

Suggested Remedy:
- Suggest XGMI and CGMII be used when referring to speed appropriate MII.

Response: Response Status: C
Accept.

Multiple comments #133, 134, 135, 136, 414, 201, and 550

Comment Type: E  Comment Status: A
Need a space between "isin"

Suggested Remedy:
- change Whether the PMA is in the Tx or Rx direction.

Response: Response Status: C
Accept.

Comment Type: E  Comment Status: A
Registers provide information., not "may provide"

Suggested Remedy:
- change The optional MDIO capability described in Clause 45 describes several variables that provide control and status information for and about the PMA. Mapping of MDIO control variables to PMA control variables is shown in Table 83-3.

Response: Response Status: C
Accept.

Overtaken by events - description of connections to other sublayers improved by changes per trowbridge_02_1108
Overview is done in a manner that is inconsistent with other PMD clauses in 802.3ba.

Suggested Remedy:
- Put text below and Table 86-2 in front of current "Overview" intro text.
- This clause specifies the 40GBASE-SR4 PMD and 100GBASE-SR10. In order to form a complete PHY, the desired PMD shall be connected to the appropriate sublayers (see Table 86-1) and with the management functions that are optionally accessible through the management interface defined in Clause 45, or equivalent.
- Renumber current Table 86-1 to 86-2.
- Label new Table 86-1 as Table 86-1-PHY (Physical Layer) clauses associated with the 40GBASE-SR4 and 100GBASE-SR10 PMDs.
- Add row in new table 86-1 for Annex 83A-XLCAUI - mark optional under 40G and "na" under 100G.
- Add row in new table 86-1 for Annex 83A-CAUI - mark optional under 100G and "na" under 40G.

Response:
- ACCEPT IN PRINCIPLE.
- It is consistent (can see that by reading lines 31-40 first) although it looks like clauses 58, 59, and it provides an overview to help first-time readers. Add nAUI to table but explain that it’s not applicable next to the PMD.<CR>As to ‘In order to form a complete PHY, the desired PMD shall be connected to the appropriate sublayers (see Table 86-1)…; see line 37. The preferred first words are now ‘When forming a complete PHY’ (e.g. Clause 72; acknowledging that a PMD can still be compliant even if not connected). Strictly, the PMD is connected to only three things; PMA, management, and medium through MDI. It cannot be asked about higher sublayers - if that is desired it should be done in Clause 80. As to ‘management functions that are optionally accessible through the management interface defined in Clause 45, or equivalent.’, 86, 87 and 88 have has ‘management functions that may be accessible through the management interface defined in Clause 45.’ In general management is optional as well as the form of its interface (for some clauses in e.g. BP Ethernet this is not the case).
- As to table ‘PHY (Physical Layer) clauses associated with the 40GBASE-SR4 and 100GBASE-SR10 PMDs’, this table exists in 86, 87 and 88 as ‘PMD type and associated clauses’. The RS is not part of the PHY although it is part of the Physical Layer.
- Delete SDD22 and SCC22. Add differential to return loss and common mode return loss.
- 0 db at the top for loss based impairments.

Recommend creating Annex 86A and moving PPI electrical specifications, as the PPI might eventually be used with PMDs.

Suggested Remedy:
- Move all PPI electrical specifications into Annex 86A.
- REJECT.
- At present, only n0GBASE-SRn uses PPI although we hope to achieve some compatibility with Clause 83A and Clause 85, and we are more likely to do a good job of making PPI consistent with the rest of Clause 86 where it is. Best to develop it in place and then revisit this question when we go to WG ballot.

Fig 83A-4 is inconsistent with similar diagrams in 802.3.

Suggested Remedy:
- Correct figure. Updated figure to be provided.
- ACCEPT.
- Correct figure. Updated figure in D'Ambrosia_03_11_08.pdf and changes listed below.
- Change high confidence region to pass region.
- Delete SDD22 and SCC22. Add differential to return loss and common mode return loss.
Cl 83A, SC 83A.3.4.5, P 140, L 3, # 140
D'ambrosia, John, Force 10 Networks

Comment Type: E
Comment Status: A

Fig 83A-7 is inconsistent with similar diagrams in 802.3

Suggested Remedy:
- Correct figure. Updated figure to be provided.

Response: Response Status: C

ACCEPT.

Cl 82, SC 82.2.2, P 117, L 3, # 141
D'ambrosia, John, Force 10 Networks

Comment Type: ER
Comment Status: A

Wording of statement: "The PCS comprises the PCS Transmit and PCS Receive processes for 40GBASE-R and 100GBASE-R." implies that a single PCS is defined for both 40G and 100G rates.

Suggested Remedy:
- Change sentence to:

  The 40GBASE-R and 100GBASE-R PCS's comprise the PCS Transmit and PCS Receive processes for each rate of operation.

Response: Response Status: C

ACCEPT.

Change:
- "The PCS comprises the PCS Transmit and PCS Receive processes for 40GBASE-R and 100GBASE-R." to:

  "The 40GBASE-R and 100GBASE-R PCS's comprise the PCS Transmit and PCS Receive processes for each rate of operation."

Cl 83, SC 83.3, P 149, L 12, # 142
D'ambrosia, John, Force 10 Networks

Comment Type: ER
Comment Status: A

The reference to the PMA or PMA stages is inconsistent and can cause confusion.

Suggested Remedy:
- Reword:

  Several PMA stages may be required to adapt between the number of VLs emerging from the PCS to the number of lanes required by a particular PMD. For example, a 4-lane interface for 100GBASE-R may involve a 2:10 PMA from the PCS, two 1:10 PMA stages on either side of a CAUI for an extender, and a 1:4 PMA which finally interfaces with the PMD.

Response: Response Status: C

ACCEPT IN PRINCIPLE.

Overtaken by events. Multiple PMA description updated per трювридж_02_1108
At the PMA service interface, the uppermost PMA in a set of one or more stacked PMAs may provide a loopback function. The function involves looping back each input lane of the uppermost Tx PMA to an output lane of the uppermost Rx PMA.

The uppermost PMA stage in a set of one or more s PMA stages may provide a loopback function. The function involves looping back each input lane of the uppermost Tx PMA stage to an output lane of the uppermost Rx PMA stage.

Presentation to be provided.

The specifications are summarized in Table 85-4 and detailed in 72.7.1.1 through 72.7.1.11 with the exception of the transmitter specified in 85.8.3.3. 85.8.3.3 is for signaling speed range, and is same for -KR.

The organisation is consistent with other clauses. The subclauses have been grouped together under 86.10 Optical channel to distinguish them from the electrical channel. Add a Maximum discrete reflectance subclause containing a specification of -20 dB.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Page</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Comment</th>
<th>Status</th>
<th>Response Status</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>147</td>
<td>22</td>
<td>T</td>
<td>A</td>
<td>add &quot;PPI&quot; as a compatibility interface</td>
<td></td>
<td></td>
<td>C</td>
<td>ACCEPT IN PRINCIPLE.</td>
</tr>
<tr>
<td>148</td>
<td>44</td>
<td>T</td>
<td>A</td>
<td>Parallel Physical Interface (PPI). The PPI is provided as a physical instantiation of the PMD service interface for 40GBASE-SR4 and 100GBASE-SR10 PHYs. While conformance with implementation of this interface is not strictly necessary to ensure communication, it is recommended, since it allows maximum flexibility in intermixing PHYs and DTEs. The PPI is optional</td>
<td></td>
<td></td>
<td>C</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>149</td>
<td>22</td>
<td>T</td>
<td>A</td>
<td>Parallel Physical Interface (PPI) is not defined.</td>
<td></td>
<td></td>
<td>C</td>
<td>ACCEPT.</td>
</tr>
</tbody>
</table>

**D'Ambrosia, John**

**Force10 Networks**

**Response Status**

**C** closed

**Comment Status**

**A** accepted

**Comment ID** # 150

---

**Comment ID** # 150

**Comment Type** T

**Comment Status** A

30.5.1.1.2 needs to be updated.

**Suggested Remedy**

Add

- 30.5.1.1.2 aMAUType
- 40GBASE-KR4 - R PCS/PMA over an electrical backplane PMD as specified in Clause 84
- 40GBASE-CR4 - R copper over 8 pair 100-Ohm balanced cable as specified in Clause 85
- 40GBASE-SR4 - R fiber over 8 OM3 multi-mode fibers as specified in Clause 86
- 40GBASE-LR4 - R fiber over 4 wavelengths on single mode fiber as specified in Clause 87
- 100GBASE-CR4 - R copper over 20 pair 100-Ohm balanced cable as specified in Clause 85
- 100GBASE-SR10 - R fiber over 20 OM3 multi-mode fibers as specified in Clause 86
- 100GBASE-LR4 - R fiber over 4 wavelengths on 10km single mode fiber as specified in Clause 88
- 100GBASE-ER4 - R fiber over 4 wavelengths on 40km single mode fiber as specified in Clause 88

**Comment Status**

**A** accepted

**Response Status**

**C** closed

**Comment ID** # 150

---

**Comment ID** # 150

**Comment Type** T

**Comment Status** A

need to update 30.6.1.1.5 aAutoNegLocalTechnologyAbility

**Suggested Remedy**

Add

- 30.6.1.1.5 aAutoNegLocalTechnologyAbility
- 40GBASE-KR4FD - Full duplex 40GBASE-KR4 as specified in Clause 84
- 40GBASE-CR4FD - Full duplex 40GBASE-CR4 as specified in Clause 85
- 100GBASE-CR10FD - Full duplex 100GBASE-CR10 as specified in Clause 85

**Comment Status**

**A** accepted

**Response Status**

**C** closed

**Comment ID** # 150

---

**Comment ID** # 150

**Comment Type** T

**Comment Status** A

[Editor's note: corrected subclause number]

The editor will implement this and many other additions to Clause 30 in the next draft.
Cl 30 SC 30.3.2.1.2 P 27 L 11 # 151
D'Ambrosia, John Force10 Networks

Comment Type T Comment Status A
30.3.2.1.2 aPhyType needs updated

Suggested Remedy
add 40GBASE-R Clause 82 40 Gb/s 64B/66B 100GBASE-R Clause 82 100 Gb/s 64B/66B

Response Response Status C
ACCEPT.

See comment #150

Cl 45 SC 45.2.1.4.8 P 33 L 49 # 152
D'Ambrosia, John Force10 Networks

Comment Type T Comment Status A
Note reads to "Insert 45.2.1.4.7 and 45.2.1.4.8 as follows" but the sections are entered in as 45.2.1.4.8 and 45.2.1.4.9

Suggested Remedy
The section #s are correct per Table 45-6, but the note is incorrect. Ignore note.

Response Response Status C
ACCEPT IN PRINCIPLE.

See comment #18

Cl 69 SC 69.1.3 P 70 L 34 # 153
D'Ambrosia, John Force10 Networks

Comment Type T Comment Status A
Implementors may not specify a different data width for 40GBASE-KR4.

Suggested Remedy
Add the following-
Modify bullet f as follows:

The MDI as specified in Clause 70 for 1000BASE-KX, Clause 71 for 10GBASE-KX4, Clause 72 for 10GBASE-KR, or Clause 84 for 40GBASE-KR4.

Response Response Status C
ACCEPT.

Cl 73 SC 73.2 P 73 L 7 # 154
D'Ambrosia, John Force10 Networks

Comment Type T Comment Status A
Figure 73-1 only reflects 1 Gb/s and 10 Gb/s, and does not reflect 40 Gb/s for 40GBASE-KR4 and 40BASE-CR4 or 100 Gb/s for 100GBASE-CR10.

Suggested Remedy
Add Fig 73-1 with the following modification: show location of auto-negotiation sublayer for 40 Gb/s and 100 Gb/s.

Response Response Status C
ACCEPT.

Cl 73 SC 73.3 P 73 L 19 # 155
D'Ambrosia, John Force10 Networks

Comment Type T Comment Status A
Lane for auto-negotiation for 40GBASE-KR4, CR4, and CR10 is not indicated.

Suggested Remedy
Add last paragraph of 73.3, as modified, per below:

When the MDI supports multiple lanes, then lane 0 of the MDI shall be used for Auto-Negotiation and for connection of any single-lane PHYs (e.g., 100BASE-KX or 10GBASE-KR).

Response Response Status C
ACCEPT IN PRINCIPLE.

[Corrected subclause number in comment]

Implement suggested remedy and correct typo change '100BASE-KX' to '1000BASE-KX'

Cl 74 SC 74.3 P 79 L 21 # 156
D'Ambrosia, John Force10 Networks

Comment Type T Comment Status A
Fig 74-1 only shows FEC for 10GBASE-R. The clause is being modified elsewhere to separate between serial and multi-lane PHY. It should be done in this figure as well.

Suggested Remedy
Add Fig 74-1 with modification to show 40BASE-R and 100BASE-R layers as well.

Response Response Status C
ACCEPT.
Aspects of the PMA layering are incorrect.

Suggested Remedy

XLAUI / CAUI should be marked as optional.

PMA (4:4) and PMA (10:10) with optional notes are actually conditional based on implementation of optional interface.

ACCEPT IN PRINCIPLE.

Stack in figure 83-2 should be replaced. Suggestion is to include most expanded case of multiple PMAs as an example, using "Example" in the title to clarify that this is not the only layering. An informative Annex should be prepared to illustrate a variety of other example configurations.

Per the baseline proposal, trowbridge_01_0708, PMA interfaces are abstract, logical, or physical.

Suggested Remedy

Change wording

Electrical and timing specifications for the XLAUI and CAUI interfaces based on 10Gb/s per lane signaling are covered in Annex 83A. The PMD service interfaces for 40GBASE-SR and 100GBASE-SR PMD are covered in 86.1.1. Other PMA interfaces are specified as logical interfaces, and may not be realized physically.

to

The interfaces for the inputs of the 40GBASE-R and 100GBASE-R PCS's are defined in an abstract manner and do not imply any particular implementation. The PMD service interfaces for 40GBASE-SR and 100GBASE-SR PMDs are defined in 86.1.1. Other PMA interfaces are specified as logical interfaces, and may not be realized physically.

to

The interfaces for the inputs of the 40GBASE-R and 100GBASE-R PCS's are defined in an abstract manner and do not imply any particular implementation. The PMD service interfaces for 40GBASE-SR and 100GBASE-SR PMDs are defined in 86.1.1. Other PMA interfaces are specified as logical interfaces, and may not be realized physically.

ACCEPT IN PRINCIPLE.

Change wording

Electrical and timing specifications for the XLAUI and CAUI interfaces based on 10Gb/s per lane signaling are covered in Annex 83A. The PMD service interfaces for 40GBASE-SR and 100GBASE-SR PMD are defined in 86.1.1. Other PMA interfaces are specified as logical interfaces, and may not be realized physically.

to

The interfaces for the inputs of the 40GBASE-R and 100GBASE-R PCS's are defined in an abstract manner and do not imply any particular implementation. The PMD service interfaces for 40GBASE-SR and 100GBASE-SR PMDs are defined in 86.1.1. Other PMA interfaces are specified as logical interfaces, and may not be realized physically.
<table>
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<tbody>
<tr>
<td>Cl 85 SC 85.1</td>
<td>P 171 L 23</td>
</tr>
<tr>
<td>D'Ambrosia, John</td>
<td>Force10 Networks</td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
</tr>
<tr>
<td>Comment Status</td>
<td>A</td>
</tr>
<tr>
<td>Reference only to XLAUI is made, and then 40G and 100G PMDs list XLAUI as optional.</td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>Add another row for 83A CAUI for row 83A XLAUI, mark 100GBASE-CR10 not applicable for row 83A CAUI, mark 40GBASE-CR4 not applicable</td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>Comment ID #</td>
<td>160</td>
</tr>
<tr>
<td>Cl 87 SC 87.1</td>
<td>P 223 L 12</td>
</tr>
<tr>
<td>D'Ambrosia, John</td>
<td>Force10 Networks</td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
</tr>
<tr>
<td>Comment Status</td>
<td>A</td>
</tr>
<tr>
<td>Table 87-1 does not include reference to Annex 83A, XLAUI.</td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>add row for Annex 83A, XLAUI and mark optional.</td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>161</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cl 88 SC 88.1</td>
<td>P 243 L 12</td>
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<td>D'Ambrosia, John</td>
<td>Force10 Networks</td>
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<tr>
<td>Comment Type</td>
<td>T</td>
</tr>
<tr>
<td>Comment Status</td>
<td>A</td>
</tr>
<tr>
<td>Table 88-1 does not include reference to Annex 83A, CAUI.</td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>add row for Annex 83A, CAUI and mark optional.</td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>Comment ID</td>
<td>Type</td>
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<td>------------</td>
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</tr>
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<td>164</td>
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<tr>
<td>165</td>
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</tr>
<tr>
<td>167</td>
<td>TR</td>
</tr>
</tbody>
</table>

**Comment ID # 164**

**Comment Type:** TR

**Comment Status:** R

The TF is waiting to hear back for confirmation from the ITU-T SG15 regarding the following statement -

The mapping of 40GBASE-R PCS into OPU3 specified in ITU-T Recommendation G.709 depends on the set of control block types shown in Figure 82-5. Any change to the coding specified in Figure 82-5 must be coordinated with ITU-T Study Group 15.

**Suggested Remedy**

Add Editor's note stating that awaiting confirmation from ITU-T SG15 of the statement above from Liaison sent from July 08 Plenary meeting.

**Response**

REJECT.

Editor's note not needed because liaison letter received from ITU-T SG15 with confirmation http://www.ieee802.org/3/minutes/nov08/1108_ITU_SG15_to_802_3_LS02.pdf

**Comment ID # 165**

**Comment Type:** TR

**Comment Status:** A

This clause points to receiver characteristics detailed in 72.7.1.1 through 72.7.2.5, which includes Rx interference tolerance testing specified in 72.7.2.1. There are potential differences in Rx interference tolerance testing between backplane and cabling testing.

**Suggested Remedy**

Create an annex 85A, which details tests for -c4 testing. Presentation to be provided.

**Response**

ACCEPT IN PRINCIPLE.

Add editors note per Adam Healey comment#272

**Comment ID # 167**

**Comment Type:** TR

**Comment Status:** A

Informative interconnect characteristics are specified, "Crosstalk requirements Informative interconnect characteristics for 40GBASE-KR4 are provided in Annex 69B." However, the crosstalk requirements for 10GBASE-KR were specified under the assumption that all crosstalk was uncorrelated. For a multilane approach crosstalk will come from correlated and uncorrelated sources.

**Suggested Remedy**

Provide a multi-lane xtalk specification that takes into account correlated & uncorrelated crosstalk sources. Presentation to be provided.

**Response**

ACCEPT IN PRINCIPLE.

Add editors note at end of 84.9

"Editors note to be removed prior to publication. Requirements for multi-lane crosstalk for 40GBASE-KR4 are being considered. See healey_01_1108.pdf page 21."

Also please provide more detailed remedy in follow up comment against 69B.

Also see comment # 470
<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR</td>
<td>A</td>
<td>168</td>
</tr>
</tbody>
</table>

**Comment:** A normative statement for the combination of sublayers is needed.

In order to form a complete PHY (Physical Layer device), a PMD is combined with the appropriate sublayers (see Table 85-1) and with the management functions, which are optionally accessible through the management interface defined in Clause 45, or equivalent.

**Suggested Remedy:** change noted sentence to

In order to form a complete PHY, the desired PMD shall be combined with the appropriate sublayers (see Table 85-1) and with the management functions that are optionally accessible through the management interface defined in Clause 45, or equivalent.

**Response Status:** C

**Comment Type:** TR

**Comment Status:** A

This clause points to receiver characteristics detailed in 72.7.1.1 through 72.7.2.5, which includes Rx interference tolerance testing specified in 72.7.2.1. This is ambiguous, as it does not indicate whether a single isolated lane is being tested or are all channels as an aggregate being tested.

**Suggested Remedy:** test on a single lane basis, (joint) presentation to be provided

**Response Status:** C

**Comment Type:** TR

**Comment Status:** A

There is an issue with Fig 83A-1. The PMA blocks above and below the XLAUI / CAUI are labeled "PMA." While some may think this is just a naming nomenclature, it does have the potential to cause confusion, as there are very different functions inherent in these PMA blocks.

**Suggested Remedy:** Replace Fig 83A-1 with Fig 83-2, except only shadowed areas are the two AUIs.

**Response Status:** C

**Comment Type:** TR

**Comment Status:** A

There is an issue with Fig 83A-1. The PMA blocks above and below the XLAUI / CAUI are labeled "PMA." While some may think this is just a naming nomenclature, it does have the potential to cause confusion, as there are very different functions inherent in these PMA blocks.

**Suggested Remedy:** Replace Fig 83A-1 with Fig 83-2, except only shadowed areas are the two AUIs.

**Response Status:** C

**Comment Type:** TR

**Comment Status:** A

This clause points to receiver characteristics detailed in 72.7.1.1 through 72.7.2.5, which includes Rx interference tolerance testing specified in 72.7.2.1. This is ambiguous, as it does not indicate whether a single isolated lane is being tested or are all channels as an aggregate being tested.

**Suggested Remedy:** test on a single lane basis, (joint) presentation to be provided

**Response Status:** C

**Comment Type:** TR

**Comment Status:** A

There is an issue with Fig 83A-1. The PMA blocks above and below the XLAUI / CAUI are labeled "PMA." While some may think this is just a naming nomenclature, it does have the potential to cause confusion, as there are very different functions inherent in these PMA blocks.

**Suggested Remedy:** Replace Fig 83A-1 with Fig 83-2, except only shadowed areas are the two AUIs.

**Response Status:** C

**Comment Type:** TR

**Comment Status:** A

This clause points to receiver characteristics detailed in 72.7.1.1 through 72.7.2.5, which includes Rx interference tolerance testing specified in 72.7.2.1. This is ambiguous, as it does not indicate whether a single isolated lane is being tested or are all channels as an aggregate being tested.

**Suggested Remedy:** test on a single lane basis, (joint) presentation to be provided

**Response Status:** C

**Comment Type:** TR

**Comment Status:** A

This clause points to receiver characteristics detailed in 72.7.1.1 through 72.7.2.5, which includes Rx interference tolerance testing specified in 72.7.2.1. This is ambiguous, as it does not indicate whether a single isolated lane is being tested or are all channels as an aggregate being tested.

**Suggested Remedy:** test on a single lane basis, (joint) presentation to be provided

**Response Status:** C

**Comment Type:** TR

**Comment Status:** A

The parameter is "SIGNAL_DETECT" but the function that generates it is "Signal Detect"
Cl 88  SC 88.6.1  P 251  L 24  # 176
Alping, Arne  Ericsson AB
Comment Type  E  Comment Status  R
  Transmitter and dispersion penalty, each lane (max) (acronym is missing)
SuggestedRemedy
  Change to: Transmitter and Dispersion Penalty (TDP), each lane (max)
Response  Response Status  C
  REJECT.
  [Subclause changed from "Table 88-7" to 88.6.1]
  The current version is consistent with Table 87-7 and Table 52-12 of the base standard.

Cl 88  SC 88.10  P 259  L 43  # 177
Alping, Arne  Ericsson AB
Comment Type  E  Comment Status  R
  ...jitter and RIN... (missing comma)
SuggestedRemedy
  Change to: ...jitter, and RIN...
Response  Response Status  C
  REJECT.
  [Subclause changed from 8.10 to 88.10]
  [Page change from 250 to 259]
  In a list, for example "Monday, Tuesday, Wednesday and Thursday" it is not usual to put a comma before the "and".

Cl 82  SC 82.2.8  P 125  L 49  # 178
Alping, Arne  Ericsson AB
Comment Type  ER  Comment Status  A
  ...has lots or transitions... (spelling error)
SuggestedRemedy
  Change to: ...has lots of transitions...
Response  Response Status  C
  ACCEPT.
  [Changed subclause number 2.8 to 82.2.8]
IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

Cl 83A SC 83A.3.4 P 286 L 34 # 182
Alping, Arne Ericsson AB

Comment Type ER Comment Status R
96.96969697 (too many significant numbers)

SuggestedRemedy
Change to: 96.9697 ps
(compare to, e.g., Table 85-4 on page 181)

Response Response Status C
REJECT.

[Editor's note: Corrected / replaced table number in subclause field with 83A.3.4]
See comment # 362

Cl 88 SC 88.7.1 P 254 L 33 # 184
Cole, Chris Finisar

Comment Type T Comment Status A

Table 88-11-100GBASE-ER4 transmit characteristics
Transmit eye mask definition (X1, X2, X3, Y1, Y2, Y3) TBD
The adopted 100GBASE-ER4 baseline (cole_01_0708) also had a footnote which stated
"Tx eye mask spec to be specified as per eye mask methodology discussions." This
specifically referred to using the results of the Statistical Eye discussions, which have now
been formalized in the Statistical Eye Ad Hoc.
Since there is no final consensus recommendation from the Statistical Eye Ad Hoc, the
specification TBD can not be completed.

SuggestedRemedy
Replace TBD in Table 88-11 with eye mask coordinates as in Clause 52, Table 52.12. Add
Transmitter Optical Waveform measurement procedure as in Clause 52 Section 52.9.7.
Remove references to 10GBASE-L and 10GBASE-W, from second and third sentence,
respectively.

Response Response Status C
ACCEPT IN PRINCIPLE.
See resolution of comment #385
See also comments #183, #185, #385

Cl 87 SC 87.6.1 P 231 L 33 # 185
Cole, Chris Finisar

Comment Type T Comment Status A

Table 87-7-100GBASE-ER4 transmit characteristics
Transmit eye mask definition (X1, X2, X3, Y1, Y2, Y3) TBD
The adopted 100GBASE-ER4 baseline (cole_01_0708) also had a footnote which stated
"Tx eye mask spec to be specified as per eye mask methodology discussions." This
specifically referred to using the results of the Statistical Eye discussions, which have now
been formalized in the Statistical Eye Ad Hoc.
Since there is no final consensus recommendation from the Statistical Eye Ad Hoc, the
specification TBD can not be completed.

SuggestedRemedy
Replace TBD in Table 87-7 with eye mask coordinates as in Clause 52, Table 52.12. Add
Transmitter Optical Waveform measurement procedure as in Clause 52 Section 52.9.7.
Remove references to 10GBASE-L and 10GBASE-W, from second and third sentence,
respectively.

Response Response Status C
ACCEPT IN PRINCIPLE.
See resolution of comment #385
See also comments #184, #185, #385
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
</tr>
</thead>
</table>
| 186        | ER           | A              | Another function of the alignment marker (lane re-order) is missing in the following sentence... "In order to support alignment and de-skew of individual lanes at the receive PCS, alignment markers are added periodically to each lane."
|            |               |                | Also, the words "alignment" and "de-skew" are redundant. | Add "lane reordering" and delete "alignment" in the sentence: "In order to support de-skew and lane reordering of individual lanes at the receive PCS, alignment markers are added periodically to each lane." | ACCEPT. | C               |
| 186        | TR           | A              | Incorrect units (Mtransfers/s) in the following sentences. "The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Mtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Mtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s." | The units should be Btransfers or Gtransers to convey billion transfers per second. | ACCEPT. | C               |
| 186        | TR           | A              | Incorrect interval in the following definition. Should be 16384. "am_valid Boolean indication that is set true if received block rx_coded is a valid alignment marker. A valid alignment marker will match one of the encodings in Table 82-2 and it will be repeated every 16385 blocks. Note that we do not know which marker to expect on which lane." | Replace 16385 with 16384. "am_valid Boolean indication that is set true if received block rx_coded is a valid alignment marker. A valid alignment marker will match one of the encodings in Table 82-2 and it will be repeated every 16384 blocks. Note that we do not know which marker to expect on which lane." | ACCEPT. | C               |

Already covered by comment #100, will be changing this.
Comment Type TR  Comment Status A
Figure 82-2-Functional block diagram is missing the lane re-ordering function in the rx path.

SuggestedRemedy
Insert a block called "Lane Reorder" after "Alignment Lock Lane Deskew" block.
The new block must be before the PCS Receive block.

Response  Response Status C
ACCEPT.

Insert block in the figure and make appropriate changes to the sub-clause, with editorial license.

Comment Type TR  Comment Status A
In Figure 82-13-PCS alignment marker lock state diagram, it appears the loop to fall out of lock will take either 4 or 7

SuggestedRemedy
We will submit a new diagram to Mark G

Response  Response Status C
ACCEPT.

[Changed subclause number from Figure 82-13 to 82.2.17.3]
This is also addressed by comment #8. It will be fixed. Use sliding window rather than fixed window to look for alignment markers. Duplicate of comment 8. Editorial license to change the state machine appropriately.
Comment Type: ER  Comment Status: R
Title is incorrect:
82.1.3.3 Physical Medium Attachment (PMD) sublayer

Suggested Remedy
Title should read:
82.1.3.3 Physical Medium Dependent (PMD) sublayer

Response  Response Status: C
REJECT.

Subclause 82.1.3.3 is going to be deleted.

Comment Type: TR  Comment Status: A
The XLAUI/CAUI specification is such that:
a. The transmit test point is defined right at the transmitter output.
b. The channel is normative
c. The receiver test point is defined right at the receiver input.
The question is:
Whose responsibility is it to ensure that the receiver input meets the specification defined
in 83A.3.4.2 "Input signal definition"?
There may be a situation where each of the components meets the spec. requirements but
the system does not work, i.e.
1. The transmitter meets the spec. requirements at its input.
2. The channel meets its specifications.
3. The receiver operates flawlessly with the input signal as defined in 83A.3.4.2.
But, since the resultant receiver input of transmitter+channel is not a requirement, the
actual input signal will be different and the system will not work.

Suggested Remedy
Leave the normative channel requirements.
Change the transmit test point so that it is tested at the receiver input.
If the transmitter meets the requirements, this will ensure a minimal input signal for the
receiver.
In addition, define the transmitter spec. requirements at that point so that they match
83A.3.4.2 "Input signal definition".

Response  Response Status: C
ACCEPT IN PRINCIPLE.

See comment #651.

Comment Type: E  Comment Status: A
In Table 84-1,
Change the 2nd column sub-title “10GBASE-KR” to “40GBASE-KR4”

Suggested Remedy

ACL

Response  Response Status: C
ACCEPT.

Also see comment #63
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Page</th>
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<th>Comment Status</th>
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<tr>
<td>200</td>
<td>125</td>
<td>49</td>
<td>E</td>
<td>A</td>
<td>Cl 82 SC 82.2.8</td>
<td>change &quot;lots or&quot; to &quot;many&quot;</td>
<td>as above</td>
<td>C</td>
<td>Cadence</td>
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<td>201</td>
<td>148</td>
<td>44</td>
<td>E</td>
<td>A</td>
<td>Cl 83 SC 83.2</td>
<td>change isin to &quot;is in.&quot;</td>
<td>As above</td>
<td>C</td>
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<td>202</td>
<td>122</td>
<td>7</td>
<td>T</td>
<td>A</td>
<td>Cl 82 SC 82.2.4.4</td>
<td>Figure 82-5 improvements</td>
<td>Remove the slash (/) in the middle of the block format description. For example change D3/D4 to D3 D4.</td>
<td>Delete redundant row with block type field 0x4b</td>
<td>Width of C5, C6 and C7 is wrong for block type files 0xcc 0xd2 0xe1</td>
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<td>126</td>
<td>32</td>
<td>T</td>
<td>A</td>
<td>Cl 82 SC 82.2.8</td>
<td>Use of boolean NOT operator. Is the use of the boolean operator ! appropriate for bit vector negation?</td>
<td>Consider changing M0 = !M4 to M4 is the inverse of M0 etc.</td>
<td>ACCEPT.</td>
<td>Cadence</td>
</tr>
<tr>
<td>204</td>
<td>128</td>
<td>30</td>
<td>T</td>
<td>A</td>
<td>Cl 82 SC 82.2.12</td>
<td>Inappropriate use of the word &quot;must&quot;.</td>
<td>Change &quot;must reorder&quot; to &quot;reorders&quot;.</td>
<td>Also similar problem on line 34 but in this case consider using shall.</td>
<td>C</td>
</tr>
</tbody>
</table>

Comment ID # 204

12/18/2008 11:18:25 P
Comment Type: T  Comment Status: A
Comment ID: 205
Marris, Arthur  Cadence
Change "1 or 0" to "one or zero" to match nomenclature in 45.2.1.9.5
SuggestedRemedy: as above
Response: Response Status: C
ACCEPT.

Comment Type: T  Comment Status: A
Comment ID: 206
Marris, Arthur  Cadence
Change "1 or 0" to "one or zero" to match nomenclature in 45.2.1.9.5
SuggestedRemedy: as above
Response: Response Status: C
ACCEPT.

Comment Type: T  Comment Status: A
Comment ID: 207
Mellitz, Richard  Intel Corporation
In Table 87-13, we propose DGD_max characteristics as "10 ps"
SuggestedRemedy: The details of DGD_max for 40GBASE-LR4 and 100GBASE-ER4 will be presented in November plenary.
Response: Response Status: C
ACCEPT IN PRINCIPLE.
[This comment taken to refer to Table 88-17]
[Subclause changed from 88-17 to 88.12]
Resolution for 100GBASE-LR4 is 10 ps as proposed by both comments.
Resolution for 100GBASE-ER4 is 10.3 ps
See also comment #297

Comment Type: ER  Comment Status: A
Comment ID: 209
Chung, Hwan Seok  ETRI
Avoid s-parameter designations and keep loss definition consistent in document. Figure 86-5
SuggestedRemedy: Use A for attenuation.
Response: Response Status: C
REJECT.
[Editor's note: corrected subclause number to 86.9 in subclause number field]
S-parameters are very well established and are a good way of presenting the information; see e.g. diminico_02_0708.pdf slide 22.
<table>
<thead>
<tr>
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<th>Line</th>
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<th>Suggested Remedy</th>
<th>Response Status</th>
<th>Response</th>
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<td>86</td>
<td>218</td>
<td>1</td>
<td>ER</td>
<td>R</td>
<td>Avoid s-parameter designations and keep loss definition consistent in document. Figure 86-5</td>
<td>REJECT.</td>
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<td>Make loss positive dB</td>
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<td>Channel loss is IL not SDD21</td>
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<td>211</td>
<td>83A</td>
<td>284</td>
<td>37</td>
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<td>Avoid s-parameter designations and keep loss definition consistent in document.</td>
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</table>

S-parameters are very well established and are a good way of presenting the information; see e.g. diminico_02_0708.pdf slide 22.
IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

Mellitz, Richard
Intel Corporation

Comment Type: ER Comment Status: A

Avoid s-parameter designations and keep loss definition consistent in document.

Suggested Remedy
Make similar to Annex 69b

Response
Response Status: C
ACCEPT IN PRINCIPLE.

Additional material required on actual values

Mellitz, Richard
Intel Corporation

Comment Type: T  Comment Status: A

Jitter not consistent with electrical characteristics of 10GBASE-KR/ 40GBASE-KR

Suggested Remedy
Add:
- Max output jitter (peak-to-peak)
- Random jitter
- Deterministic jitter
- Duty Cycle Distortion

Response
Response Status: C
ACCEPT IN PRINCIPLE.

Remedy provided in #562.

Mellitz, Richard
Intel Corporation

Comment Type: T  Comment Status: A


Suggested Remedy
Utilize style of IL, A, ILD, RL, and ICR in Annex 69b if parameters are applicable.

Response
Response Status: C
ACCEPT IN PRINCIPLE.

Editors note 83A.4 :[XLAUI / CAUI channel will consider using parameters 69B when appropriate.]

Remedy provided in comment#600.

Mellitz, Richard
Intel Corporation

Comment Type: TR  Comment Status: A

It's not clear how to perform Tx and Rx compliance testing without details of context.

Suggested Remedy
Define test fixtures and coordinate test point through out document.

Response
Response Status: C
ACCEPT IN PRINCIPLE.

Remedy provided in comment#556.
**Comment #219**

**Cl 45 SC 45.2.3.17a P 57 L 1 # 219**

**Gustlin, Mark Cisco**

**Comment Type** ER  **Comment Status** A

Table title should include "register 1" since there are register 2,3 etc...

**Suggested Remedy**

Change it to:

"Table 45-96a-Multi-lane BASE-R PCS alignment status register 1 bit definitions"

**Response**

ACCEPT.

[Editor's note: Corrected subclause field from Table 45-96a to 45.2.3.17a]

---

**Comment #220**

**Cl 45 SC 45.2.3.15 P 55 L 18 # 220**

**Gustlin, Mark Cisco**

**Comment Type** ER  **Comment Status** A

Currently it says:

"The test-pattern methodology is described in 49.2.8"

But this should also refer to clause 82 for 40/100G.

**Suggested Remedy**

Change to:

"The test-pattern methodology is described in 49.2.8 for 10 Gb/s and in 82.2.10 for 40/100GBASE-R"

**Response**

ACCEPT IN PRINCIPLE.

---

**Comment #221**

**Cl 45 SC 45.2.3.16 P 56 L 1 # 221**

**Gustlin, Mark Cisco**

**Comment Type** ER  **Comment Status** A

Table name is incorrect, should include 40/100.

Is:

Table 45-95-10GBASE-R PCS test-pattern error counter register bit definitions

**Suggested Remedy**

Change to:

Table 45-95-10/40/100GBASE-R PCS test-pattern error counter register bit definitions

**Response**

ACCEPT.

---

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

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

**SORT ORDER** Comment ID

---

Page 48 of 161  12/18/2008 11:18:25 P
<table>
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<tr>
<th>Cl</th>
<th>74</th>
<th>SC 74.4.2</th>
<th>P 79</th>
<th>L 41</th>
<th># 222</th>
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Subclause 74.5 (which is not part of our D1.0) needs to be changed to enable it to hook up to our PCS and PMA sublayers.

Here are the current primitives for the FEC clause (based on the 16 bit wide parallel bus):

- **FEC (clause 74) primitives:**
  - a) FEC_UNITDATA.request(tx_data-group<15:0>)
  - b) FEC_UNITDATA.indication(rx_data-group<15:0>)
  - c) FEC_SIGNAL.indication(SIGNAL_OK)

Right now this clause won’t hook up to the PCS or PMA clause. Right now for the 40/100G PCS:

- **PMA_UNITDATA.request**x (x = 0-3 for 40GBASE-R) **PMA_UNITDATA.indicatex** (x = 0-3 for 40GBASE-R) **PMA_SIGNAL.indication**

We need to add the correct primitives to the FEC clause so it hooks up to the 40/100G PCS/PMA.

**Suggested Remedy**

This could just be:

- 40GBASE-R and 100GBASE-R run one instance of the FEC sublayer on each PCS lane.
- To hook up to the PCS or PMA sublayers, the following primitives are used.

For 40GBASE-R the primitives are:

- **PMA_UNITDATA.request**x (x = 0-3)
- **PMA_UNITDATA.indicatex** (x = 0-3)
- **PMA_SIGNAL.indication**

For 100GBASE-R the primitives are:

- **PMA_UNITDATA.request**x (x = 0-19)
- **PMA_UNITDATA.indicatex** (x = 0-19)
- **PMA_SIGNAL.indication**

**Response**

**Response Status** C

**ACCEPT IN PRINCIPLE.**

Add subclause 74.5 with indicated service interface definition for 40GBASE-R and 100GBASE-R. Should be consistent with primitive naming comment 620. Editorial license. Description is for a single bit-wide PCS lane (not 16-bit as in current clause 74) FEC block instantiated 4 or 20 times.

---

<table>
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<tr>
<th>Cl</th>
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<th>P 110</th>
<th>L 51</th>
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</tr>
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Remove the following:

- "81.3.5 PCS MDIO function mapping"

(Editor's note (to be removed prior to publication) - Insert MDIO/MII variable mapping"

Clause 81 has no function mapping.

**Suggested Remedy**

As above

**Response**

**Response Status** C

**ACCEPT.**

Remove:

- "81.3.5 PCS MDIO function mapping"

(Editor's note (to be removed prior to publication) - Insert MDIO/MII variable mapping"

---

<table>
<thead>
<tr>
<th>Cl</th>
<th>82</th>
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<th>P 116</th>
<th>L 6</th>
<th># 224</th>
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</table>

In figure 82-2 there is a box around the encode and scramble blocks that is labeled PCS transmit. Enlarge this box to incorporate the block distribution and alignment insertion also. Also enlarge the box labeled PCS receive in include the BER monitor, alignment lock and lane block lock blocks.

Historically these boxes tried to include what was part of what state machine in clause 49, but it was not clear and confuses the issue.

**Suggested Remedy**

As above

**Response**

**Response Status** C

**ACCEPT. Remove boxes around Tx and Rx, leaving only functional blocks**
Comment Type: TR  Comment Status: A

Remove:

"[Editor's note (to be removed prior to publication) - The primitive descriptions below need to be reconciled with the FEC primitives.]

Another comment has been added to clause 74 to make the changes so it can connect to clause 62.

Suggested Remedy: As above

Response Status: C

ACCEPT. See comment 222, clause 74 for the alignment of the FEC clause.

Comment ID # 227

---

Comment ID # 226

Comment Type: TR  Comment Status: A

The PCS lane lock and high ber SMs won't work properly with the FEC block due to how the FEC block marks errors.

Suggested Remedy: Make the changes to the state machine to implement what is in gustlin_03_1108. This will be presented at the meeting.

And Remove:

"[Editor's note (to be removed prior to publication) - FEC errored block marking will likely change some of the state machines since the FEC sublayer will need to mark many blocks bad to ensure that all 64B packets are dropped.]

Response Status: C

ACCEPT. Make the changes as stated in slides 13 and 15 of gustlin_03_1108.

---

Comment ID # 227

So that 40G and 100G will have similar behavior when it comes to the PCS SM interactions with uncorrectable FEC blocks, change 40G marking behavior to be consistent with 100G (mark all blocks bad).

Suggested Remedy: Change: The single lane PHY marks every 8th 64B/66B block, the four PCS-lane PHY marks every second 64B/66B block and the twenty PCS-lane PHY marks every 64B/66B block.

To: The single lane PHY marks every 8th 64B/66B block, the four and twenty PCS-lane PHYs marks every 64B/66B block.

Make the same change on line 31 of the same page also.

Response Status: C

ACCEPT IN PRINCIPLE.

See comment 87, it is not strictly true to say the single lane PHY marks every 8th block.

Change text from:
When the decoder is configured to indicate decoding error, the decoder indicates error to the PCS by means of setting both sync bits to the value 11 in the 1st, 9th, 17th, 25th, and 32nd of the 32 decoded 64B/66B blocks from the corresponding errored FEC block, thus forcing the PCS sublayer to consider this block as invalid for a single lane PHY. Multi-PCS-lane PHYs require errors to be marked in more of the 64B/66B blocks to ensure that detected errors are signaled to the MAC for every frame containing an error. The single lane PHY marks every 8th 64B/66B block, the four PCS-lane PHY marks every second 64B/66B block and the twenty PCS-lane PHY marks every 64B/66B block.

Change to:
When the decoder for 10GBASE-R is configured to indicate decoding error, the decoder indicates error to the PCS by means of setting both sync bits to the value 11 in the 1st, 9th, 17th, 25th, and 32nd of the 32 decoded 64B/66B blocks from the corresponding errored FEC block, thus forcing the PCS sublayer to consider this block as invalid.

When the decoder for 40GBASE-R or 100GBASE-R is configured to indicate decoding error, the decoder needs to mark errors in more of the 64B/66B blocks to ensure that detected errors are signaled to the MAC for every frame containing an error. The FEC sublayers for 40GBASE-R and 100GBASE-R mark all thirty-two 64B/66B blocks to indicate error to the PCS.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>SC</th>
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<th>Response Status</th>
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</thead>
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<td>229</td>
<td>45</td>
<td>TR</td>
<td>Remove section 82.2.21.</td>
<td>C</td>
</tr>
<tr>
<td>230</td>
<td>45</td>
<td>TR</td>
<td>Clarify the text that for 100/40GBASE-R PRBS patterns are in the PMA, and add the appropriate PMA registers for this functionality.</td>
<td>C</td>
</tr>
<tr>
<td>231</td>
<td>83</td>
<td>TR</td>
<td>Remove the additions of 100/40GBASE-R to this register.</td>
<td>C</td>
</tr>
</tbody>
</table>

### Comment 229

- Gustlin, Mark (Cisco)
- **Comment Type**: TR
- **Comment Status**: A
- **Response Status**: C

> Remove this subclause. And remove the editors note saying to add it in, and remove this section since this is being put in section 82.2.18.

### Comment 230

- Gustlin, Mark (Cisco)
- **Comment Type**: TR
- **Comment Status**: A

> The description implies that the PCS can support a PRBS31 or PRBS9 test pattern, but for 100/40GBASE-R these are now part of the PMA functions, not the PCS (and there can be multiple locations of the test patterns).

### Comment 231

- Gustlin, Mark (Cisco)
- **Comment Type**: TR
- **Comment Status**: A

> In 100/40GBASE-R the pseudo random test pattern is just sending idles scrambled, so there are no seed patterns needed.

### Response

- **Response Status**: C

> No change to this register - remove it from the draft.

### Update PMA register block with the following:

- 1.x.15 PRBS31 pattern testing ability
- 1.x.11:0 PRBS31 error count
- 1.y.15 PRBS31 transmit test pattern enable
- 1.y.14 PRBS31 receive test pattern enable

The wording of 45.2.3.11 is correct as it covers 10G, 40G and 100G.
Add in support for a PRBS9 pattern.

SuggestedRemedy

Change: "When transmit PRBS31 test pattern (see 49.2.8) is enabled (TBD - should a shorter pattern, e.g., PRBS9 (see 68.6.1) be included also?), the PMA generates a PRBS31 pattern on each of its output lanes."

To: "When transmit PRBS31 test pattern (see 49.2.8) is enabled, the PMA generates a PRBS31 pattern on each of its output lanes. When transmit PRBS9 test pattern is enabled, the PMA generates a PRBS31 pattern on each of its output lanes."

Also add in anywhere else in the clause where it is appropriate the support for the PRBS9.

Response Response Status C

ACCEPT IN PRINCIPLE.

Add an editor's note indicating that there is agreement to add support for a short test pattern, and it is TBD whether that pattern is PRBS7, PRBS9, or a manufactured pattern. Operation of the short test pattern can be specified while the pattern itself is TBD. Editorial license.

Comment Type TR Comment Status A

Comment ID # 236

In clause 45, subclause 45.2.3.2.2, PCS receive link status(3.1.2) , the supporting paragraph talks about 10GBASE-R using this bit as a latching low version of bit 3.32.12. This should be the same for 40/100GBASE-R.

SuggestedRemedy

Add in appropriate text for 40/100GBASE-R.

Response Response Status C

ACCEPT IN PRINCIPLE.

In 45.2.3.2.2 change:

"10GBASE-R, 10GBASE-W, or 10GBASE-T"

to

"10/40/100GBASE-R, 10GBASE-W, or 10GBASE-T"

Comment Type TR Comment Status A

Comment ID # 235

In table 45-97a, the bits are numbered incorrectly, they should all be 3.51.x vs. 3.50 since the previous register used 3.50.x already.

SuggestedRemedy

Change to 3.51.x in this table.

Response Response Status C

ACCEPT.

Comment Type TR Comment Status A

Comment ID # 236

In table 45-99a, the bits are numbered incorrectly, they should all be 3.53.x vs. 3.50 since a previous register used 3.50.x already.

SuggestedRemedy

Change the numbering to 3.53.x

Response Response Status C

ACCEPT.
Comment ID # 237

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

The behavior does not allow unidirectional operation which is what is intended.

**Suggested Remedy**  
As above.

**Response**  
Response Status: C

Remove the editors note.

Comment ID # 238

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

Currently the BER target is TBD. Change this to a BER of 10^-15. The PMD BER target is 10^-12, but if you have two CAUI/XLAUI interfaces in series with a PMD interface, all with a BER of 10^-12, you won't meet the overall goal of 10^-12. In addition this is a chip to chip interface which typically requires a higher BER target. 10^-15 seems to be a reasonable and achievable target.

**Suggested Remedy**  
Change: "The receiver shall operate with a BER of better than TBD in the presence of a reference input signal as defined in 83A.3.4.2"  
To:  
"The receiver shall operate with a BER of better than 10^-15 in the presence of a reference input signal as defined in 83A.3.4.2"  

**Response**  
Response Status: C

ACCEPT IN PRINCIPLE.  
[Editor's note: corrected Clause number from 83 to Annex 83A as this comment refers to Annex 83A]

Comment ID # 239

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

Today in clause 74, subclause 74.5.3 it describes the primitive FEC_SIGNAL_indication. This states if the FEC receive is in lock or not. This is fine for the legacy 16 bit parallel interface, but for 40/100GbE the FEC block could be across a XLAUI or CAUI interface from the PCS. It would be better if we defined the behavior for loss of FEC lock also for the case where we just have the XLAUI or CAUI if between the PCS and FEC block.

**Suggested Remedy**  
Define the FEC loss of lock behavior as sending the raw unsynchronized bit stream to the PCS. Without FEC lock, and without the FEC block lock restoring the 66b blocks, the receive PCS will be down and out of lock which is what we want in this situation.

**Response**  
Response Status: C

ACCEPT IN PRINCIPLE.  
Define the FEC loss of lock behavior as sending the raw unsynchronized bit stream to the PCS. Editorial license to match primitive naming. This only affects 40GBASE-R and 100GBASE-R FEC, not 10GBASE-R.
Comment ID #  243

Cl  83  SC  83.6.7  P  155  L  38  #  243
Meyer, Jeffrey  Centellax

Comment Type  E  Comment Status  A
FEC

This is merely a grammar comment for the sentence "Timer for the amount of time to wait...". The sentence should begin with an article like "The timer for the amount of time to wait.". This also appears on line 9.

SuggestedRemedy
Begin the sentence with an article like "The".

Response  Response Status  C
REJECT.

This is text from the base standard. Making a change like this is unnecessary and would require changing the definition of all ten timers in Clause 73.
Comment Type  T  Comment Status  A
Why is there a term for 1/sqrt(f) in the insertion loss formula. The coefficient will most likely be 0.000 because it blows up at low frequencies. Read and microwave transmission line book and you see that the loss approaches a constant at low frequencies. Instead you need a constant term for the DC loss.

Suggested Remedy
Insertion loss (d) <= TBD + TBD * sqrt(f) + TBD * f

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Comment Type  T  Comment Status  A
In equation ( 85-6) the power of the NEXT loss is denoted NL(f). This is poor notation. Subscripts should not appear after function arguments.

Suggested Remedy
More appropriate notation would be NLi(f).

Response  Response Status  C
ACCEPT.

Comment Type  T  Comment Status  A
Should "96 bits" entry for 40 Gb/s and 100 Gb/s include reference to "NOTE 7" below the table? Note 7 explains that this could be as little as 8 bits in the Rx direction

Suggested Remedy
Include reference to Note 7 in this table cell

Response  Response Status  C
ACCEPT IN PRINCIPLE.

change Note 7 to foot note b against 96 bits in last column.
Comment Type: E  Comment Status: A

It is unclear how the Alignment markers are inserted without changing the PMA clock rate.

Suggested Remedy:
Insert a note indicating that columns of Idle will need to be deleted prior to the scrambler. The number of columns to delete will be an average of 1 column of Idle for every 16384 MII columns, however this is just an average since the alignment markers will be inserted on all lanes at the same time.

Response: Response Status: C
ACCEPT IN PRINCIPLE.

[Changed subclause number 2.8 to 82.2.8]

Change:
"They interrupt any transfer that is already occurring so that the alignment markers can be inserted into all lanes at the same time."

to:
"They interrupt any transfer that is already occurring so that the alignment markers can be inserted into all lanes at the same time. Room for the alignment markers is created by periodically deleting IPG from the MII data stream"
Comment Type T  Comment Status A
am_invalid_cnt is currently written to use a 4 block window.

Suggested Remedy
Change the definition to use a "4*16384 block window"

Response
ACCEPT. Dup of 252, 106

Comment Type T  Comment Status A
31.25us_timer and 12.5us_timer are not referenced by the BER monitor state diagram.

Suggested Remedy
Remove 31.25us_timer and 12.5us_time and define xus_timer as "Timer that is triggered every 31.25 us +1%, -25% (for 40GBASE-R) or 12.5 us +1%, -25% (for 100GBASE-R)"

Response
ACCEPT.

[Changed subclause number 2.17.3 to 82.2.17.3]

Comment Type T  Comment Status A
Figure 82-15 - BER monitor state diagram
The sentence "xus_timer = 31.25 usec for 40GBASE-R or 12.5 usec for 100GBASE-R" is not necessary if xus_timer is defined in subclause 82.2.17.2.5. This sentence does not fully define the timer because it does not include the +1%/-25% tolerance.

Suggested Remedy
Remove this sentence.

Response
ACCEPT.

[Changed subclause number 2.17.3 to 82.2.17.3]
Comment Type  TR  Comment Status  R

Figure 82-13 - PCS alignment marker lock state diagram.

There is no valid exit from state INVALID_AM if am_lock<x> = false and am_invalid_count < 4.

Suggested Remedy
Remove am_lock<x> from the exit condition to transition from state INVALID_AM to TEST_AM, making the exit condition "test_am * am_cnt < 4 * am_invalid_cnt < 4".

Response  Response Status  C
REJECT.

This comment was WITHDRAWN by the commenter.

[Changed subclause number 2.17.3 to 82.2.17.3]

Looking at the SM, if you are in INVALID_AM, and you do not have am_lock, then you go to AM_SLIP. That is because when you are looking for am_lock you need to see two non errored ones in a row to declare lock. If you are not in lock, and you see an error, then you drop out, the invalid count at that point does not matter.

Talked to Dave by email:
I see what I did wrong, I misread the transition from INVALID_AM to AM_SLIP, I read it as "am_invalid_cnt=4 * Iam_lock<x>" when it is really "am_invalid_cnt=4 + Iam_lock<x>". This way makes more sense!
He agrees to reject the comment.

Comment Type  TR  Comment Status  A

The Block Payload descriptions for block types 0xb4, 0xcc, 0xd2, and 0xe1 are incorrect. They do not include enough single bit fields. 0xb4 should have 4 but only 3 are displayed, 0xcc should have 3 but only 2 are displayed, 0xd2 should have 2 but only 1 is displayed, 0xe1 should have 1 but none are displayed.

Suggested Remedy
Add one single bit field to the Block Payload descriptions for block types 0xb4, 0xcc, 0xd2, and 0xe1.

Response  Response Status  C
ACCEPT.

[Changed subclause number 2.4.3 to 82.2.4.3]

Already covered by comment #7 and proposed accepted.

Comment Type  E  Comment Status  R

Change from:
Table 86-1
Type A1a.2a (50/125 ìm multimode) "OM3"

Suggested Remedy
Change to:
Table 86-1
Type A1a.2a (50/125 ìm multimode) "OM3 or better"

Indicates higher performing fibers will be suitable

Response  Response Status  C
REJECT.

[Editor's note: corrected subclause number to 86.1 in subclause number field]

One is always allowed to use better; no need to say it.
IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

Cl 86 SC 86.6.6 P 212 L 26 # 261
Vanderlaan, Paul Nexans

Comment Type E Comment Status A
Change From
"Effective modal bandwidth at 850 nm"

Suggested Remedy
Change to:
"Minimum Effective modal bandwidth at 850 nm"
Indicates higher performing fibers will be suitable

Response Response Status C
ACCEPT IN PRINCIPLE.

[Editor's note: corrected subclause number to 86.6.6 in subclause number field]

This is an example, with 'worst allowed' fibre. See 86.10 for the actual specs. In Table 86-18, make Effective modal bandwidth a minimum.

Cl 82 SC 82.2.4.10 P 123 L 37 # 262
Healey, Adam LSI Corporation

Comment Type E Comment Status A
It is not necessary to have two sub-clauses addressing ordered sets at the same level in the clause hierarchy.

Suggested Remedy
Merge information in 82.2.4.10 and 82.2.4.5.

Response Response Status C
ACCEPT.

Cl 82 SC 82.2.4.3 P 122 L 12 # 264
Healey, Adam LSI Corporation

Comment Type E Comment Status R
In Figure 82-5, it could be made more clear which control block format corresponds to a sequence ordered set and which corresponds to a signal ordered set without requiring the reader to cross-reference to Table 82-1.

Suggested Remedy
Add a note to the table distinguishing the two ordered set block formats.

Response Response Status C
REJECT.
The way that ordered sets is handled has changed. (#247) This comment no longer is necessary, OTBE.

Cl 82 SC 82.2.5 P 124 L 9 # 265
Healey, Adam LSI Corporation

Comment Type E Comment Status A
Text seems essentially correct but could be compacted and clarified, using similar language to 48.4.2.3. A lot of words are used to describe the concept of traversing clock domains, which really shouldn't be necessary for a user of the standard.

Suggested Remedy
Suggest:
"The transmit process must delete idles or sequence ordered sets to accomodate the transmission of alignment markers. If the PCS transmit process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles."

Response Response Status C
ACCEPT.

Change:
"Therefore, if the PCS is connected to an MII and PMA sublayer where the ratio of their transfer rates is exactly 32:33, then the transmit process only needs to perform rate adaptation to make room for the alignment markers. This will consist of deleting idles or deleting sequence ordered sets. Where the MII and PMA sublayer data rates are not synchronized to that ratio, the transmit process will need to insert idles, delete idles, or delete sequence ordered sets to adapt between the rates in addition for making room for alignment markers."

To:
"The transmit process must delete idles or sequence ordered sets to accomodate the transmission of alignment markers. If the PCS transmit process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles."

This to me seems like a slippery slope, since many things in clause 82 differ from clause 49, do I put a note everywhere where this a difference?
Receive process must also insert idles to compensate for removal of alignment markers.
Also suggest using similar language as 48.4.2.3 for the concept of clock rate compensation.

Suggested Remedy

Suggest:
"The receive process must insert idles to compensate for the removal of alignment markers. If the PCS receive process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles."

Response

ACCEPT IN PRINCIPLE.
Change:
"Where the MII and PMA sublayer data rates are not synchronized to a 32:33 ratio, the receive process will insert idles, delete idles, or delete sequence ordered sets to adapt between rates."

"The receive process must insert idles to compensate for the removal of alignment markers. If the PCS receive process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles."

Comment #268 where is it is proposed that the variable deskew_error is to be deleted is also related to this.
### Comment 268

**Comment ID # 268**

<table>
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<th>L</th>
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<th>Response Status</th>
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<td>82.2.17.2.2</td>
<td>130</td>
<td>51</td>
<td>A</td>
<td>C</td>
<td>ACCEPT.</td>
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<td>Healey, Adam</td>
<td>LSI Corporation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment Type:** T  
**Comment Status:** A  
What is the difference between deskew_error and !alignment_valid?

**Suggested Remedy:**
Clarify the difference. If there is no difference, delete deskew_error and substitute !alignment_valid in PCS deskew state diagram (Figure 82-14).

**Response**
ACCEPT.

Makes sense, will change 82-14 appropriately and delete deskew_error

### Comment 269

**Comment ID # 269**

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
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<th>Response Status</th>
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<td>135</td>
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<td>LSI Corporation</td>
<td></td>
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</tr>
</tbody>
</table>

**Comment Type:** T  
**Comment Status:** A  
The data pattern that the PCS transmits to the PMA during loopback is not defined (TBD).

**Suggested Remedy:**
Recommend a continuous stream of 0x00FF data words per Clause 49.

**Response**
ACCEPT IN PRINCIPLE.

0x00ff is not good since it would be mangled through the PMA gearbox and may result in insufficient clock content on individual lanes, confusing SERDES, etc.

Following the PMA loopback methodology, the PCS should send onward the signal it is looping back.

### Comment 270

**Comment ID # 270**

<table>
<thead>
<tr>
<th>Cl</th>
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<th>L</th>
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<td>1</td>
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<td>LSI Corporation</td>
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</tr>
</tbody>
</table>

**Comment Type:** T  
**Comment Status:** A  
Subclause 73.5.1.1 needs to be amended for 40GBASE-KR4, 40GBASE-CR4, and 100GBASE-CR10 to ensure the PHY’s exchange DME pages on a common lane.

**Suggested Remedy:**
Amend last sentence of 73.5.1.1 to read: "When the PHY has 10GBASE-KX4, 40GBASE-KR4, 40GBASE-CR4, or 100GBASE-CR10 capability, DME pages shall be transmitted only on lane 0. The transmitters for unused lanes should be disabled as specified in 71.6.7, "insert appropriate cross-references"."

**Response**
ACCEPT IN PRINCIPLE.

[corrected subclause number in comment]

See remedy in comment # 441
### Comment #271

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

**Healey, Adam**  
LSI Corporation

**Comment Type**  **Comment Status**

Receiver interference tolerance requirement is unclear. Annex 69A defines a test for a 10GBASE-KR receiver in isolation.

Does this requirement imply that a single 40GBASE-KR4 lane is tested in isolation? If so, should the unused lanes be terminated by the reference impedance, and what is their operational state (active or quiescent)?

If all lanes are to be tested in parallel, are parallel instances of the Annex 69A set-up required, or does a new multi-lane test apparatus need to be defined?

**SuggestedRemedy**

A supporting presentation will be provided to compare several approaches to this problem and suggest a direction.

**Response**  **Response Status**

ACCEPT IN PRINCIPLE.

Follow proposal in summary slide of healey_01_1108.pdf and test in isolation with other lanes transmitters active.

Add paragraph at end of 84.8.2.1 so 84.8.2.1 reads as follows:

The receiver interference tolerance tests are the same as those described for 10GBASE-KR in 72.7.2.1 and Annex 69A.

For 40GBASE-KR4 each lane shall be tested individually using the methodology defined in Annex 69A with the transmitters of the unused lanes active and terminated by the reference impedance.

See also comment # 166

---

### Comment #272

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

**Healey, Adam**  
LSI Corporation

**Comment Type**  **Comment Status**

"Receiver characteristics are summarized in Table 85-5 and as detailed in 72.7.1.1 through 72.7.2.5 with the exception of the receiver characteristics specified in 85.8.4.1, 85.8.4.2, and 85.8.4.3."

Subclause 71.7.2.1, Receiver interference tolerance, which references Annex 69A, defines a test for a 10GBASE-KR receiver in isolation.

At the same time, subclause 85.8.4.1 states that "the receiver shall operate with a BER 10^-12 or better when receiving a compliant transmit signal, as defined in 85.8.3, through a compliant cable assembly as defined in 85.9 exhibiting the maximum insertion loss of 85.9.2."

This implies that all lanes as tested as an aggregate using a cable assembly model spanning TP2 to TP3.

Which requirement applies?

**SuggestedRemedy**

A supporting presentation will be provided to compare several approaches to this problem and suggest a direction.

**Response**  **Response Status**

ACCEPT IN PRINCIPLE.

Editors note added to be added add end of 85.8.4.1: to clarify ambiguity recognized by commenter.

---

### Comment #273

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

**Healey, Adam**  
LSI Corporation

**Comment Type**  **Comment Status**

Clause 85 references Clause 72 in multiple places, yet uses a definition of TP1 and TP4 that is inconsistent with definition in Clause 72. This will inevitably lead to confusion.

**SuggestedRemedy**

Define TP1 and TP4 in a manner consistent with their use in Clause 72, or add a note explaining the mapping.

**Response**  **Response Status**

ACCEPT IN PRINCIPLE.

Suggested remedy comment #450
This subclause states that "the skew budget that the PCS receiver must support is shown in Table 82-4." The skew budget in Table 82-4 presumes a concatenation of optional interfaces and a generous allocation for media skew that may not be present in every compliant implementation. Consider, for example, that a 40GBASE-KR4 PHY has a need for considerably less skew tolerance. By mandating a fixed tolerance, needless latency is introduced for this PHY type. One can expect a demand for low latency interfaces in the marketplace.

Also note that the receiver skew tolerance requirements are not defined in Clause 48 which defines similar deskew functionality.

Suggested Remedy

It is sufficient to define the maximum skew contributions for each component of a 40 Gb/s and 100 Gb/s link leading up to the input of the PCS receiver. These contributions may be summarized in a table (such as Clause 48, Table 48-5) so that the implementer may easily calculate the skew tolerance required for the targeted application. Remove the normative requirement for PCS skew tolerance (including Table 82-4).

Overtaken by events. The skew will be specified in clause 80 and removed from clause 82 (see comment 240). The maximum skew to be tolerated does not equate to latency.
Comment: It would be helpful to indicate where in clause 83 the effect of receipt is defined. Also applies to 88.1.1.3.3

Suggested Remedy:
Change "in Clause 83" to "in 83.3.3.3"
Also make this change in 88.1.1.3.3

Response: ACCEPT IN PRINCIPLE.
Change the reference to 83.4 in 87.2.3.7 and 88.2.4.3

Comment: This Note says "NOTE- This annex is numbered in correspondence to its associated clause; i.e., Annex 83A corresponds to Clause 83." However, the only Annex with a note of this kind is the first one, Annex 4A

Suggested Remedy:
Remove the note

Response: ACCEPT.

Comment: In Table 83A-1 the specification for the Differential Output S-parameters is "(see "Equation 83A-1")". This should refer to the clause defining the requirement not just the equation. This also applies to the next row in this table and also two places in Table 83A-2

Suggested Remedy:
Change "(see "Equation 83A-1")" to "(see 83A.3.3.3"
in the next row change "(see "Equation 83A-2")" to "see 83A.3.3.4"
in Table 83A-2 change "(see "Equation 83A-3")" to "see 83A.4.4.4"
in Table 83A-2 change "(see "Equation 83A-4")" to "see 83A.4.5"

Response: ACCEPT.

Comment: The title of Figure 83A-3 is "Figure 83A-3- Driver output voltage limits and definitions [SLi<P> and SLi<N> are the positive and negative sides of the differential signal pair for lane i (i = 0, 1, 2, 3 for XLAUI. For CAUI i = 0.9)]. The text within the square brackets should not be part of the figure title.

Suggested Remedy:
Move this text to be a note under the figure as is done for Figure 85-2 and 85-9

Response: ACCEPT.

Comment: The second Editors Note underneath Table 88-7 beginning "The adopted baseline for 100GBASE-LR4 in anslow_01_0708.pdf had a value of 3.2 dBm" was only relevant before the draft was accepted by the Task Force and should now be deleted.

Suggested Remedy:
Delete this Editors Note

Response: ACCEPT.

Comment: It would be useful to add external equations to the list of references marked in dark blue

Suggested Remedy:
Change "NOTE- Cross references that refer to clauses, tables, or figures not covered by this amendment are highlighted in dark blue." to "NOTE- Cross references that refer to clauses, tables, figures or equations not covered by this amendment are highlighted in dark blue."

Response: ACCEPT IN PRINCIPLE.
Change to:
NOTE- Cross references that refer to clauses, tables, equations, or figures not covered by this amendment are highlighted in dark blue.
Several very minor editorial issues in clause 45 collected in to one comment.

SuggestedRemedy
Remove underline from Table 45-58a page 43 line 5
Remove underline from Table 45-58b page 44 line 21
Space missing in "status register3" page 61 line 8
Space missing in "Table45-133" page 65 line 13

Response
ACCEPT.

Several very minor editorial issues in clause 80 collected in to one comment.

SuggestedRemedy
Change "for e.g." to "e.g." in page 87 lines 18 and 21
Change "concepts of MII:" to "concepts of the MII:" page 94 line 15
Change "implemented DIC" to "implemented the DIC" page 104 line 3
Change "a RXC" to "an RXC" page 106 line 38
Page 111 line 12 external reference to clause 21 should be blue

Response
ACCEPT.

Several very minor editorial issues in clause 82 collected in to one comment.

SuggestedRemedy
Change "PMA service interfaces" to "PMA service interface" page 115 line 47
Change "wide, data" to "wide data" page 117 line 9
Change "to 64B/66B block" to "to 64B/66B blocks" page 117 line 10
Change "markers are shown" to "markers is shown" page 126 line 20
Change "for 40GBASE-R PCS:" to "for the 40GBASE-R PCS:" page 126 line 47
External links "21.5" and "14.2.3.2" should be blue page 130 lines 1 and 2
All blue text in 82.2.18.1 are register numbers which should not be blue
Blue text in 82.2.18.4 is a register number which should not be blue

Response
ACCEPT.

This comment also affects Clause 81.

Several very minor editorial issues in clause 83 collected in to one comment.

SuggestedRemedy
Change "for 40GBASE-SR and 100GBASE-SR PMD" to "for the 40GBASE-SR and 100GBASE-SR PMDs" page 143 line 22
Space missing in "isin" page 148 line 44

Response
ACCEPT.

Also see reponse to comment #158.

Several very minor editorial issues in clause 84 collected in to one comment.

SuggestedRemedy
Note 2 is in 10 point font rather than the usual 9 point page 165 line 33
External references to clause 21 should be blue page 168 lines 15 and 48

Response
ACCEPT.
# IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments Draft 1.0 Comments

## Task force Review

### Comment ID: 288

**Cl/ 85 SC 85.1 P 171 L 10 # 288**

Anslow, Peter

Nortel Networks

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

Several very minor editorial issues in clause 85 collected in to one comment.

**Suggested Remedy:**

- Reference to Clause 45 should be cross-reference page 171 line 10
- The dash between 81 and RS should be an em-dash page 171 line 18
- The dash between 73 and Auto-Negotiation should be an em-dash page 171 line 30
- Change "interface for these" to "interfaces for these" page 172 line 45
- Reference to Clause 45 should be cross-reference page 174 line 49
- Space missing in "disable 9to" page 175 line 17
- The word "Global_" is in 10 point font right side of page 175 line 33
- Force the second "PMD_" to next line on left side of page 175 line 35
- Remove space between "PMD_SIGNAL.indication" and "(SIGNL_DETECT)" in two places page 178 lines 38 and 39
- Change "When a Global_PMD_.." to "When Global_PMD_.." page 179 line 24
- Change "NOTES 1" to "NOTE1" page 179 line 51
- Change "2" to "NOTE2" page 180 line 3
- It would be useful to colour external equation references blue (see comment on front matter) page 181 lines 28, 29, 30, 31 also page 183 lines 18 an 19
- Set pagination to "Anywhere" to remove blank half page for heading 85.9.1 page 185 line 1
- External reference to clause 21 should be blue page 197 line 11

**Response:** Response Status C  
ACCEPT.

### Comment ID: 290

**Cl/ 86 SC 86.6.1 P 208 L 11 # 290**

Anslow, Peter

Nortel Networks

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

Several very minor editorial issues in clause 86 collected in to one comment.

**Suggested Remedy:**

- In Table 86-6 The "TP1a Deterministic Jitter output" min and max values are blank
  - Same issue for Table 86-7 "AC common mode input voltage tolerance" max

**Response:** Response Status C  
ACCEPT.

### Comment ID: 291

**Cl/ 86 SC 86.7.4.7.1 P 216 L 1 # 291**

Anslow, Peter

Nortel Networks

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

Clause 86.7.4.7.1 "Eye mask for TP1a and TP4" should be a subclause of 86.7.3 "Electrical parameters" and not 86.7.4 "Optical parameter definitions"

**Suggested Remedy:**

- Move the "Eye mask for TP1a and TP4" clause to 86.7.3

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

**Eye mask material now in three sections; common, electrical and optical**
Cl 86  SC 86.6.1  P 208  L 10  # 293
Anslow, Peter  Nortel Networks

Comment Type  T  Comment Status  A  DJ
In Table 86-6 there are two jitter parameters "TP1a Total Jitter output" and "TP1a Deterministic Jitter output" where it is not clear if this is UI peak to peak or not.
Also applies to:
Table 86-7 "Total Jitter tolerance at TP1a"
Table 86-11 "Total Jitter output at TP4"
Table 86-12 "Total Jitter tolerance"

Suggested Remedy
Either change the parameter names to include "(pk-pk)" or change the units to be UI pt

Response  Response Status  C
ACCEPT IN PRINCIPLE.

See response to 402

Cl 4A  SC 4A.4.2  P 267  L 28  # 294
Anslow, Peter  Nortel Networks

Comment Type  T  Comment Status  A
Under the new note 4 there is a warning box containing "WARNING Any deviation from the above specified values may affect proper operation of the network." This implies that this warning note must be included again.

Suggested Remedy
Delete the warning box and change the editing instructions to say that the new note 4 is inserted before the warning box.

Response  Response Status  C
ACCEPT.

See also comment #16

Cl 83A  SC 83A.3.3  P 283  L 32  # 295
Anslow, Peter  Nortel Networks

Comment Type  T  Comment Status  R
In Table 86-6 there are two jitter parameters "Maximum Total Jitter" and "Maximum Deterministic Jitter" where it is not clear if this is UI peak to peak or not.
Also applies to:
Table 83A-2 "Maximum Total Jitter"
Table 83A-2 "Maximum non-EQ Jitter (TJ - ISI)"

Suggested Remedy
Either change the parameter names to include "(pk-pk)" or change the units to be UI pt

Response  Response Status  C
REJECT.
The definitions are inappropriate for pk-pk.

Cl 87  SC 87.11  P 239  L 15  # 296
Anslow, Peter  Nortel Networks

Comment Type  T  Comment Status  A  Optical
In Table 87-13 the value of DGD_max is "TBD". The DGD_max value for 10GBASE_LR in Table 52-24 is 10 ps. This equates to a link PMD coefficient of 0.8 ps/sqrt(km) (assuming S = 3.75) and is expected to give only a small penalty at 10.3125 GBd.

Suggested Remedy
In Table 87-13 set the value of DGD_max to 10 ps
See anslow_04_1108.pdf for more detail.

Response  Response Status  C
ACCEPT.

See also comment 207
In Table 88-17 the values of DGD_max for 100GBASE-LR4 and 100GBASE-ER4 are "TBD".

Suggested Remedy

- Set DGD_max for 100GBASE-LR4 to 10 ps
- Set DGD_max for 100GBASE-ER4 30 km to 10.3 ps
- Set DGD_max for 100GBASE-ER4 40 km to 10.3 ps

See anslow_04_1108.pdf for detailed justification.

Response

- ACCEPT IN PRINCIPLE.

Resolution for 100GBASE-LR4 is 10 ps as proposed by both comments.

Resolution for 100GBASE-ER4 is as comment #208

During the review of version 0.9 of the draft, some issues were raised concerning the block diagrams in clauses 86, 87 and 88. These diagrams should be clear and also consistent with each other and with Figure 86-3 for the symbols used for optical and electrical connectors.

Suggested Remedy

- Replace Figures 86-1, 87-1 and 88-1 with those shown in anslow_05_1108.pdf

Response

- ACCEPT IN PRINCIPLE.

Based on implementations in FPGAs, I have measured the delay through the MAC, RS and MAC Control layers and would like to suggest the values for this delay that is currently in table 150-1 to be changed as per this comment.

Suggested Remedy

- In table 150-1, row 1, change 8129 to 17920.
- In table 150-1, row 1, change 16 to 35.
- Supplemental material is provided in support of this remedy.

Response

- ACCEPT IN PRINCIPLE.

[Editor's note: Commenter has used old clause numbers. Changed Clause number from 150 to 80]

In table 80-1
- add row for 40G MAC, RS and MAC control delays maximum bit time 4800
- change 100G delays add row for 100G MAC, RS and MAC control delays maximum bit time 17920
- editorial license to calculate the matching pause quanta

Also see comment #301
Based on implementations in FPGAs, I have measured the delay through the PCS and would like to suggest the TBD values for the PCS round trip delays to be changed as described here. These delays are specified in table 150-1.

**Suggested Remedy**

Change the TBD fields for 40GBASE-R PCS round trip delay to: 11264 bit time in column 2, and 22 pause quanta in column 3.

Change the TBD fields for 100GBASE-R PCS round trip delay to: 35328 bit time in column 2, and 69 pause quanta in column 3.

Supplemental material is provided in support of this remedy.

**Response**

ACCEPT IN PRINCIPLE.

[Editor's note: Commenter has used old clause numbers. Changed Clause number from 150 to 80]

In table 80-1 on page 89

Correct table number to 80-2

add row for 40G PCS delays maximum bit time 11264

change 100G PCS delays maximum bit time 35328

editorial license to calculate the matching pause quanta

Also see comment #300

---

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

Footnote to Table 86-1: Should we add reference to the TIA-492AAAC-A standard. The IEC standard is currently referenced.

**Suggested Remedy**

REJECT.

Maybe it was a typographical error in the baseline.

**Response**

REJECT.

No; if international standards are available, we should use them. Now if TIA documents were free and IEC ones paid for, there would be an incentive.
Fibre specs

Oulundsen III, George

Response

ACCEPT IN PRINCIPLE.

In Table 86-18 change "Effective modal bandwidth" to "Effective modal bandwidth (min)"

Change
"Effective modal bandwidth for fiber meeting TIA/EIA-492AAAC-2002 [Editor's note (to be removed prior to publication) - Is there an IEC equivalent now?] when used with sources meeting the wavelength and encircled flux specifications of Table 52-7."

to
"When measured with the launch conditions specified in Table 86-8"

See comment #520.

Skew

Dallesasse, John

Response

ACCEPT IN PRINCIPLE.

REJECT.

[Editor's note: subclause changed from "Table 86-8" to "86.6.2"]

Removing the encircled flux specification would lead to an unknown fiber modal bandwidth which could be less than that for overfilled launch and unknown connector loss (which could be more than that for overfilled launch).
The lane wavelengths used for the 40GBASE-LR4 PMD should be the same as the wavelengths used for the Clause 53 10GBASE-LX4 PMD. This will allow maximum re-utilization of laser and optical demultiplexer technologies developed for 10GBASE-LX4. Reducing development costs have a direct impact on the economic feasibility of this project. It would be a mistake to walk away from a technology investment that has been paid for and proven over years of manufacturing. Additionally, the proposed reduction of the channel bandwidth from 13.4 nm (10GBASE-LX4) to 13 nm (40GBASE-LR4) would have some impact on laser yields and consequently cost. In order to allow a 0-70 C module operating range, the lasers need to be in spec from -5 to +85C. Assuming 0.1 nm/C, 9 nm of the band is taken by temperature. Approximately 1.5 nm is allocated for guard bands. Consequently, the window that is being targeted for laser operation at a given temperature is 2.5 nm for the proposed 40GBASE-LR4 versus 2.9 nm for 10GBASE-LX4.

Baseline proposal wavelengths were selected to minimize worst case dispersion penalty and loss.

Delete the paragraph. Anyone who thinks it leaves a void can bring in something better next time.

FEC is specified as optional in Clauses 84 and 85. This table captures this correlation.

Any change to FEC requirement for respective PMDs need to be discussed in the task force.

Related to comments #322, and #370
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Response Status</th>
<th>Comment ID</th>
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</tr>
</thead>
<tbody>
<tr>
<td>313</td>
<td>TR/technical</td>
<td>R</td>
<td>REJECT.</td>
<td>315</td>
<td>T/technical</td>
<td>R</td>
<td>REJECT.</td>
</tr>
<tr>
<td>316</td>
<td>T/technical</td>
<td>A</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>315</td>
<td>T/technical</td>
<td>A</td>
<td>ACCEPT IN PRINCIPLE.</td>
</tr>
</tbody>
</table>

Auto-negotiation is an unnecessary burden on front-side ports. See another comment.

Provide two columns under '73', Auto-negotiation M for 40GBASE-KR4 only (blank for all others), Link Negotiation (if we keep that name) O or M as decided for 40GBASE-CR4 and 100GBASE-CR10. Revise 82.2.20.

Mac Control PAUSE can't be used with long links because the round trip latency becomes too much to cope with. At each higher MAC rate, this is ever more true. If the entity above the MAC wants to know the round trip latency, it should use Ping or similar method to find it out for a particular link. Even with this table, for many port types there is no guarantee that the nominal maximum latency is not exceeded because 'A PMD which exceeds the operational range requirement while meeting all other optical specifications is considered compliant'.

Remove the table rows for 40GBASE-LR4 PMD, 100GBASE-LR4 PMD and 100GBASE-ER4 PMD. Delete 87.2.1 and 88.2.1, change '87.2 Delay and skew' to '87.2 Skew', similarly 88.2.

The Pause requirement and text is consistent with 802.3-2008 base standard for different Physical layers.

"Editor's note... The service interface notation used in 802.3ba PMD PMA clauses have some differences from the notations used for 10GbE sublayer interfaces. The differences need to be explained in the introductory Clause 80."

What is the difference/issue?

If found to be OK, delete this and similar notes.

With multi-lane sublayers, these time units are confusing. 'bit time' was always confusing to PMD and PMA engineers.

Add a column in ns. Consider deleting one of the two 'Maximum' columns in D3.0. If we keep a column in bit times, change 'bit time' to 'MAC bit time'.
Comment ID # 317
Dawe, Piers Avago Technologies

<table>
<thead>
<tr>
<th>Comment ID</th>
<th>SC</th>
<th>P</th>
<th>Comment Type</th>
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<tr>
<td>80 SC 80.3</td>
<td>P 89</td>
<td>44</td>
<td>T</td>
<td>A</td>
<td>TBDs</td>
</tr>
<tr>
<td>81 SC 81.3.4</td>
<td>P 108</td>
<td>22</td>
<td>T</td>
<td>A</td>
<td>TBDs</td>
</tr>
</tbody>
</table>

**Comment Type:** T

**Comment Status:** A

**Delay:**

- **TBDs**
- **Accept the proposed Round-trip delay limit for 40GBASE-SR4 and 100GBASE-SR10.**
  
  **Response:** C
  
  **ACCEPT.**
  
  update SR4 to 1024 bit times
  
  SR10 to 2048 bit times

Comment ID # 318
Dawe, Piers Avago Technologies

<table>
<thead>
<tr>
<th>Comment ID</th>
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<th>P</th>
<th>Comment Type</th>
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</tr>
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<tr>
<td>81 SC 81.3.1.3</td>
<td>P 102</td>
<td>7</td>
<td>T</td>
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<td>Delay</td>
</tr>
</tbody>
</table>

**Comment Type:** T

**Comment Status:** R

**Delay:**

- **Some of the lines shown are impossible with the hex values given.**
  
  **SuggestedRemedy:**
  
  Remove the lines below '0xFF' and above '0x00'. Also Fig. 81-6, 81-7.

**Response:** C

**REJECT.**

Although the comment makes some sense, the way that the data bus is shown is consistent with typical conventions on how a data bus is shown in a timing diagram, and is consistent with clause 46.

Comment ID # 320
Dawe, Piers Avago Technologies

<table>
<thead>
<tr>
<th>Comment ID</th>
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<tbody>
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<td>82 SC 82.1.1</td>
<td>P 146</td>
<td>1</td>
<td>E</td>
<td>R</td>
<td>Delay</td>
</tr>
</tbody>
</table>

**Comment Type:** E

**Comment Status:** R

**Delay:**

- **Draft says 'The terms 40GBASE-R and 100GBASE-R are used when referring generally to Physical Layers using the PCS defined here.' There should be nothing rate-specific in the PCS clause; these are generically useful PCSs that could be re-used at faster VL rates in future. The PCSs could be thought of as 'R4' and 'R20'.**

**SuggestedRemedy**

No urgent need to rename them, but it's worth adding a sentence to say that one uses 4 PCS lanes and the other uses 20 PCS lanes, here in the Scope.

**Response:** C

**REJECT.**

Right now this PCS is rate specific for 40 and 100G
Dawe, Piers Avago Technologies

Comment Type T  Comment Status A

Comment: "medium be compliant at the PMA level.‘ The medium is not at the PMA level, and not connected directly to the PMA. Also, there could be FEC between PMA and PCS.

Suggested Remedy

Does this work: 'The 40GBASE-R and 100GBASE-R PCSs can operate with any full duplex medium requiring only that the sublayers below the PCS provide a compliant service interface to the PCS.'

Response

ACCEPT IN PRINCIPLE.

Delete the sentence:
"40GBASE-R and 100GBASE-R can be extended to support any full duplex medium requiring only that the medium be compliant at the PMA level." The sentence does not provide any value
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
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</tr>
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<tbody>
<tr>
<td>80</td>
<td>80.2.3</td>
<td>88</td>
<td>45</td>
<td>323</td>
<td></td>
</tr>
<tr>
<td>Dawe, Piers</td>
<td>Avago Technologies</td>
<td>Good introductory material overlooked in 82.1.3.</td>
<td></td>
<td></td>
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<td></td>
<td>Comment Status: A</td>
</tr>
<tr>
<td>SuggestedRemedy:</td>
<td>Either add sentence here 'The functions of the PCS, FEC, PMA, PMD and AN sublayers are summarized in 82.1.3.' or move 82.1.3. into 80.2.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Response:</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
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<td>82.1.3.2</td>
<td>115</td>
<td>6</td>
<td>324</td>
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</tr>
<tr>
<td>Dawe, Piers</td>
<td>Avago Technologies</td>
<td>Missing sublayers</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
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<td>Comment Status: A</td>
</tr>
<tr>
<td>SuggestedRemedy:</td>
<td>Add new subclauses summarizing the FEC and AN sublayers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response:</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>82</td>
<td>82.2.8</td>
<td>127</td>
<td>6</td>
<td>326</td>
<td></td>
</tr>
<tr>
<td>Dawe, Piers</td>
<td>Avago Technologies</td>
<td>The two PCSs are distinguished by width not lane rate. In future we will consider using one or both at faster lane rates, and quite likely consider 20 x 10G for 200G. The lane markers for a 4-wide PCS should be distinct from a 20-wide PCS.</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Comment Type: T</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Comment Status: A</td>
</tr>
<tr>
<td>SuggestedRemedy:</td>
<td>Add four new lane markers for the 4-wide 40GBASE-R PCS. Pete Anslow has the markers and a presentation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response:</td>
<td>ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See comment 299 for specific values</td>
</tr>
</tbody>
</table>
Tracking the last little bit of skew costs power in high speed analog circuitry. The PCS is implemented as a silicon chip in a package on a PCB. It has no need to generate anything remotely like 2 bits of Dynamic Skew (if 'bits' means UI). There could be several x 10 ps gate delay, most of which is correlated lane to lane (giving maybe 5 ps Dynamic Skew) plus perhaps 2° or 400 ps mismatched lane lengths on the PCBs, which might change by 5% over temperature and humidity: that's 20 ps. Total 25 ps (0.25 UI at 10G, 1 MAC BT for 40G, 2.5 MAC BT for 100G).

SuggestedRemedy
Change PCs dynamic skew output limit to 25 ps.

Response
REJECT.

Overtaken by events. Skew will be covered in clause 80 and not in the PCS clause. See comment #240. Commenter can resubmit against clause 80 if solution from giannakopoulos_01_1108 is not acceptable.

The primary purpose of the nAUI spec is the same as the XFI spec at 10G: to provide a standardised and interoperable spec for plugging retimed transceiver modules into line cards or similar. Like XFI (part of XFP), it needs to take a connector into account (does not need to define the connector mechanicals) and define the compliance points with reference to the connector.

SuggestedRemedy
Use the six TP compliance points defined in 86.7.1, relegate the points in Fig 83A-2 to informative reference points like A and D in SFP+.

Response
REJECT.

Additional compliance points may be required in nAUI, but they may not be the same six TP defined in 86.7.1.

Additional presentation material required.

It's not clear that these jitter specs allow the two concatenated CDRs and an optical link, XFP style, that will be wanted when connecting e.g. a 40GBASE-LR4 module.

SuggestedRemedy
Modify the jitter specifications to be sure they do. This may mean that the specs on the transmit side and receive side differ. See presentation.

Response
REJECT.

It is not necessary for XAUI / CAUI specifications to spell this out. nAUI needs to ensure the nAUI link works properly. TP2/3 needs to make sure the optical link works properly.
Comment ID # 331

Cl 83 SC 83 P 143 L 1 # 331

Dawe, Piers Avago Technologies

Comment Type E Comment Status A

sub-layer

SuggestedRemedy
To match base document, sublayer. Search and replace, 18 instances.

Response Response Status C

ACCEPT.

Also see comment #95

Comment ID # 332

Cl 83 SC 83 P 146 L 10 # 332

Dawe, Piers Avago Technologies

Comment Type T Comment Status A

Text says 'the supportable PMA stages' but table is not complete. For example, Tx 2:1 is missing. If you add all the missing possibilities the table might get rather long, although the rows could be shallower. I don't think we should talk about 'initial version of the standard': 802.3 is very old, and we have not yet made any promises that there will be a version which will use more of this table.

SuggestedRemedy
Suggest you list only the 'prime factors'. For 40G, that's 4:2, 2:1, 1:2, 2:4., 1:1, 2:2, 4:4. Say in main text, not just a table note, that PMAs such as 4:1 and 1:4 may be made without going though the intermediate (in this case 2-wide) stage (and if such is true, they could map the lanes a bit differently to how a tree of atomic PMAs would).

Response Response Status C

ACCEPT IN PRINCIPLE.

Delete table 83-1. Replace with text to indicate that for 40GBASE-R, the number of input and output lanes are divisors of 4 and for 100GBASE-R, the number of input and output lanes are divisors of 20.

Comment ID # 333

Cl 83 SC 83 P 146 L 6 # 333

Dawe, Piers Avago Technologies

Comment Type T Comment Status A

Are these _logical_ lanes or just lanes?

SuggestedRemedy
?

Response Response Status C

ACCEPT IN PRINCIPLE.

Overtaken by events. Table 83-1 removed, and replacement text does not use the word "logical".

Comment ID # 334

Cl 83 SC 83.1.2 P 143 L 30 # 334

Dawe, Piers Avago Technologies

Comment Type T Comment Status A

PCS lanes are not always virtual.

SuggestedRemedy
I think we should rename 'virtual lane' to 'PCS lane' throughout.

Response Response Status C

ACCEPT IN PRINCIPLE.

Need an acronym: suggest PCSL. In figure 83-4 and elsewhere, use z as lane count instead of v, and add to legend that z=4 for 40GBASE-R and z=20 for 100GBASE-R (consistent with p149 lines 32-40).

Also affects Clause 82. Remove Virtual Lane comments from clause 82.

Comment ID # 335

Cl 83 SC 83.3.1.1 P 150 L 6 # 335

Dawe, Piers Avago Technologies

Comment Type E Comment Status A

PMA_UNITDATA.inputx (input_bit_lane_x)

SuggestedRemedy
PMA_UNITDATA.inputx(input_bit_lane_x)
i.e. without the space. Same in following subclauses.

Response Response Status C

ACCEPT.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>336</td>
<td>E</td>
<td>A</td>
<td>PMA_UNITDATA.indicate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>337</td>
<td>T</td>
<td>C</td>
<td>What does 'Tx PMA implemented synchronously with PCS' mean?</td>
<td>REJECT.</td>
<td></td>
</tr>
<tr>
<td>338</td>
<td>T</td>
<td>C</td>
<td>Other Tx PMA Dynamic Skew tolerance should not have unnecessary padding, as compensating the last couple of UI with analog circuitry costs power. I believe CEI have a 1.5 UI limit for 'Relative Wander' (their term for Dynamic Skew). 'bits/VL' would need explaining.</td>
<td>REJECT.</td>
<td></td>
</tr>
<tr>
<td>339</td>
<td>T</td>
<td>C</td>
<td>Specification range for cable insertion loss is not adequate at either end. SFP+ Annex E cable 5-parameter specs go from 10 MHz to 11.1 GHz.</td>
<td>REJECT.</td>
<td></td>
</tr>
<tr>
<td>340</td>
<td>T</td>
<td>C</td>
<td>SFP+ &quot;SFF-8431 Specifications for Enhanced 8.5 and 10 Gigabit Small Form Factor Pluggable Module&quot; defines the electrical interface specifications for 8.5 and 10 Gigabit/s Small Form Factor Pluggable (SFP+) modules and hosts and optionally support lower signaling rates as well.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**COMMENT STATUS: D/dispatched A/accepted R/rejected**

**RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn**

**SORT ORDER: Comment ID**
Auto-negotiation is an unnecessary burden on the host. It is not necessary for these copper links, and should not appear on front-panel ports.

**Suggested Remedy**

Delete Auto-negotiation from Clause 85. Remove the Note at Clause 73, but provide a table showing which port types could use Auto-negotiation proper, which could use Parallel Detection (see below), and which could use Training.

Formalize and extend 'Parallel Detection' (73.7.4.1 Parallel Detection function) as a properly specified Link Negotiation based on the principles of Fibre Channel's Link Speed Negotiation.

See presentation.

**Response**

REJECT.

Draft 1 reflects consensus for AN usage for negotiating FEC capability (commonality with KR/KR4) and parallel detection function to detect legacy 10GBASE-CX4.

The sub-task force reviewed and discussed dawe_01_11_08.pdf

---

I understand that 10 m is extremely challenging. A link like this if it fails will create error bursts not just single errors, endangering mean time to false packet acceptance.

**Suggested Remedy**

Do investigations to quantify the level of difficulty. First, can a reasonable 10 m cable with reasonable lengths of PCB traces give a channel within the high confidence region as defined for 10GBASE-KR in 802.3ap Annex 69B? Second, is that an adequate or complete condition for as low-BER link?

Define a length and cable electrical spec above which FEC is mandatory, and/or reduce the distance objective for Clause 85.

**Response**

REJECT.

Many of the steps in the suggested remedy have been performed. Yes, a reasonable 10 m cable with reasonable lengths of PCB traces gives a channel within the high confidence region as defined for 10GBASE-KR in 802.3ap Annex 69B; please see diminico_02_0708.pdf "802.3ba copper cable assembly baseline proposal".

What's reasonable in PCB trace length is subjective; the baseline includes guidance to use nicholl_01_0708.pdf.

A length and electrical specification is embodied in draft 1 for review and comment.
**Comment Type:** TR  **Comment Status:** R

It is very good that TP1, TP2 TP3 TP4 are positioned in relation to the connector, but not clear enough where they are exactly with respect to the connector. While for some measurements like S-parameter measurements on a passive cable, de-embedding can be used to infer the performance right next to the connector. For measurements of nonlinear active elements like transmitters and receivers, in general this cannot be done.

**SuggestedRemedy**

Use the same defined reference losses between each TP and the connector as in Clause 86: this includes specifying the loss between PMD and TP2 in 85.8.3.1 Fig 85-3. For the S-parameter specs, where de-embedding is viable, give the equivalent de-embedded specs also so that the cables can be assessed using either approach.

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

REJECT.

Consistent with CX4, all cable assembly measurements are to be made between TP1 and TP4 as illustrated in Figure 85-2. Two mated connector pairs have been included in the cable assembly specifications defined in 85.9.

TP1 and TP4 are not test points for the measurements of nonlinear active elements like transmitters and receivers.

PCB trace loss at TP0 defined (Tx_pcb) and at TP5 (Rx_pcb).

We intend to close on the test point measurements regarding de-embedding utilizing editors note.

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

Accepting the proposed delay limits.

**SuggestedRemedy**

Accept the proposed delay limits. If we continue to specify delay in BT, change 'bit-times' to 'MAC bit-times' twice. Now that reviewers have had a chance to read the editor's note, delete it.

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

ACCEPT IN PRINCIPLE.

Change first two sentences of clause 86.2.1 to:

"A 40GBASE-SR4 PMD shall incur a round-trip delay (transmit and receive) of not more than 1024 bit-times, or 2 pause_quanta, including 2 m of fiber. A 100GBASE-SR10 PMD shall incur a roundtrip delay (transmit and receive) of not more than 2048 bit-times, or 4 pause_quanta, including 2 m of fiber."

Also delete editor's note.

The commenter is invited to submit a comment regarding changing 'bit-times' to 'MAC bit-times' against the whole draft rather than one PMD type.

See also comment #317

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

Proposing skew limits

**SuggestedRemedy**

For overall skew, see Gustlin presentation. For dynamic skew: 200 ps from PMA, 100 ps PMD Tx add, 700 ps medium add, 200 ps PMD Rx add, giving 1200 ps returned to PMA. Remove editor's note.

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

ACCEPT IN PRINCIPLE.

Insert editors note at the end of clause 86.2.2 to say:

"The dynamic skew limit at SP2 may be too high, further information is invited"

Commenter is invited to review the implementation of the resolution of comment #240 in draft 1.1 and comment against that if it is not acceptable.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Response</th>
<th>Response Status</th>
<th>Suggested Remedy</th>
<th>Task force Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>346</td>
<td></td>
<td>T</td>
<td>A</td>
<td>Cl 86 SC 86.4.1</td>
<td>Dawe, Piers Avago Technologies</td>
<td>Editor's note</td>
<td>See Anslow presentation and comment, remove editor's note</td>
<td></td>
</tr>
<tr>
<td>347</td>
<td></td>
<td>T</td>
<td>R</td>
<td>Cl 86 SC 86.5</td>
<td>Dawe, Piers Avago Technologies</td>
<td>Note to clause editor: check that 'There are no lane assignments' is compatible with e.g. lane by lane signal detect function.</td>
<td>Per comment</td>
<td></td>
</tr>
<tr>
<td>348</td>
<td></td>
<td>T</td>
<td>R</td>
<td>Cl 86 SC 86.6.3</td>
<td>Dawe, Piers Avago Technologies</td>
<td>Have we allowed enough for connector loss?</td>
<td>Check that we have allowed enough for 100 m of fibre and a reasonable number of connectors, remembering that with a restricted launch, the actual connector loss is less than the measured connector loss. Reduce the numbers in the minimum column by 0.1 dB if appropriate, and adjust Table 86-13, fill in TBDs in 86.10.2.2.1. Remove the footnote here.</td>
<td></td>
</tr>
<tr>
<td>349</td>
<td></td>
<td>T</td>
<td>A</td>
<td>Cl 86 SC 86.6.1</td>
<td>Dawe, Piers Avago Technologies</td>
<td>Deterministic Jitter spec or 99% jitter spec? Also at PPI receive side.</td>
<td>Deterministic Jitter spec or 99% jitter spec? Also at PPI receive side.</td>
<td></td>
</tr>
</tbody>
</table>
Comment ID # 350
Dawe, Piers
Avago Technologies

Comment Type T
Comment Status A

For AC common mode voltage, Termination mismatch and Transition time, copy text from SFF-8431 D3.1 with appropriate modifications (this is not issued at time of writing but will be issued before the P802.3ba co-located interim)

SuggestedRemedy
Use text from SFF-8431 D3.1 with appropriate modifications (this is not issued at time of writing but will be issued before the P802.3ba co-located interim)

Response Response Status C

ACCEPT.

And see comments # 482, 483.

Comment ID # 351
Dawe, Piers
Avago Technologies

Comment Type T
Comment Status A

As we are not doing the maintenance work to remove all references to ANSI/EIA/TIA-455-127-1991, we can't do this by a 'change'

SuggestedRemedy

In the draft replace 'Change the following reference... Laser Diodes.' with another entry for the 'insert' list, TIA-455-127-A-2006, FOTP-127-A-Basic Spectral Characterization of Laser Diodes.

Response Response Status C

ACCEPT.

See also comment # 354

Comment ID # 352
Dawe, Piers
Avago Technologies

Comment Type T
Comment Status A

Another reference for the list (not sure if it's a normative or informative reference)

SuggestedRemedy

Add G.709

Response Response Status C

ACCEPT IN PRINCIPLE.

G.709 is the standard for OTN
Add the following reference to Annex A (informative references):

ITU-T G.709 Interfaces for the optical transport network (OTN)

See resolution of comment # 585.

Comment ID # 354
Dawe, Piers
Avago Technologies

Comment Type T
Comment Status A

As we are not doing the maintenance work to remove all references to ANSI/EIA/TIA-455-127-1991, we can't do this by a 'change'. But we should add the new TIA-455-127-A to the normative references, so no point adding it here also. Nothing to do.

SuggestedRemedy

Delete 'Change B8 as follows... Lasers Diodes.'

Response Response Status C

ACCEPT.

See response to comment # 351
Cl 86 SC 86.10.1 P 218 L 45 # 355
Dawe, Piers Avago Technologies

Comment Type T Comment Status A Skew
Skew of medium per Gustlin is 45 UI (4.5 ns).

Suggested Remedy
If this seems high, revisit the stress assumptions in the skew model.

Response Response Status C
ACCEPT IN PRINCIPLE.
See resolution of comment # 308
See also comments 517.

Cl 86 SC 86.10.2.1 P 219 L 27 # 356
Dawe, Piers Avago Technologies

Comment Type T Comment Status A Fibre specs
3.5 dB/km for fibre cable loss seems pretty gross, much higher than the uncabled fibre loss. Is it still that bad?

Suggested Remedy
?
Response Response Status C
ACCEPT IN PRINCIPLE.
The value of 3.5 dB is still correct in ISO/IEC 11801 Ed 2.0
Replace "3.5 TBD" with "3.5" in Table 86-18

Cl 86 SC 86.1 P 219 L 3 # 357
Dawe, Piers Avago Technologies

Comment Type T Comment Status A
A question and two editor’s notes on this page

Suggested Remedy
Consult the experts and clear up.

Response Response Status C
ACCEPT IN PRINCIPLE.
Change "simplex[?]" to "unidirectional"
Draft 1.0 Comments

Cl 83A  SC 83A.3.3  P 283  L 21  # 361
Dawe, Piers  Avago Technologies

Comment Type  E  Comment Status  A
Table too narrow

Suggested Remedy
Resize LH column to contents

Response  Response Status  C
ACCEPT.

Cl 83A  SC 83A.3.3  P 283  L 7  # 362
Dawe, Piers  Avago Technologies

Comment Type  T  Comment Status  A
If you have stated the signalling rate there is no need to give the unit interval, and 'Baud period' is slang.

Suggested Remedy
Delete 'The corresponding Baud period is nominally 96.96969697 ps.' and the similar row in Table 83A-1.

Response  Response Status  C
ACCEPT.

Delete 'The corresponding Baud period is nominally 96.96969697 ps.' and the similar row in Table 83A-1 and the similar row in Table 83A-2.

Cl 83A  SC 83A.3.3  P 284  L 42  # 363
Dawe, Piers  Avago Technologies

Comment Type  ER  Comment Status  R
Editor's note says 'The Return Loss limits in Figure 83A-4 and Figure 83A-7 may have to be plotted in log linear scale with loss being positive. The definition or formatting to be reconciled similar to the definition or plots in base spec 802.3-2008 Annex 69B'. Just because another clause did or didn't use a log frequency scale does not tie our hands. Just because another clause didn't use S-parameters doesn't preclude us from using S-parameters.

Suggested Remedy
Do the right thing for our circumstances. S-parameters are good. Vertical grid lines would be welcome.

Response  Response Status  C
REJECT.

Although I am always up for doing the right thing, I think the group is leaning towards reusing Annex 69B

Cl 83A  SC 83A.3.4.5  P 288  L 23  # 364
Dawe, Piers  Avago Technologies

Comment Type  T  Comment Status  R
As one of these lines is the same as a line in Fig 83A-4

Suggested Remedy
Remove this figure and put the four limits (three traces) on Fig 83A-4 (extending the vertical scale to -16).

Response  Response Status  C
REJECT.

Consensus to keep independent limits lines to distinguish individual parameters are favoured.

Cl 83A  SC 83A.3.4.5  P 286  L 48  # 365
Dawe, Piers  Avago Technologies

Comment Type  T  Comment Status  A
'non-EQ Jitter (TJ - ISI)' There's no definition of what 'non-EQ Jitter' means in this document, nor this usage of 'ISI'. I suspect if I saw one I would not agree with it ;-)

Suggested Remedy
Find a better metric, or explain these terms.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Remedy provided in comment#562.

Cl 83A  SC 83A.5  P 291  L 36  # 366
Dawe, Piers  Avago Technologies

Comment Type  T  Comment Status  R
Like a PMA or PCS clause, nAUI is completely on a single line card or similar, so the draft doesn't need environmental specifications for it.

Suggested Remedy
Delete the subclause

Response  Response Status  C
REJECT.

83A.5. Environmental specifications need to be addressed.
Won't 100GBASE-ER4 suffer from SOA noise and will benefit from FEC to achieve a suitably low BER reliably?

**Suggested Remedy**

Add FEC to Table 88-1, at least as an option, and I suspect mandatory for 100GBASE-ER4. Do more investigation to find out if it needs be mandatory: maybe only for the longest links.

**Response**

REJECT.

The optical power budgets in the adopted baseline were chosen to enable a BER of 10^-12 without the use of FEC. See for instance slide 17 of cole_02_0508.pdf

The device address structure of Clause 45 dates from XENPAK days. As the PMD and PMA may now be separate, they cannot always be managed as a single MMD unless a proxy is used. Even then, one loses the ability to control each one independent of the other with the present allocation of MMDs to registers. Also, there can be multiple separate PMAs for any port, with multiple possible loopback positions for example.

**Suggested Remedy**

Continue to manage the PMD with device address 1, but allocate a device address number (the next available is 8) to PMA. Use a register within address 8 as an addressing scheme to distinguish between multiple PMDs of the same port. Copy the old stuff relevant to 40G/100G PMAs from 1 to 8, put the new stuff in 8. I believe a nAUI interface can count as a n:n PMA, but there could be two sorts like the 'PHY XS and DTE XS' in 10G.

**Response**

ACCEPT IN PRINCIPLE.

Current device address 1 is defined for PMA/PMD and it is approriate to leave it as such. There must always be a PMA sublayer bound to the PMD and this device address should refer to those two sublayers.

A new and separate device address can be used to address higher PMA sublayers. It may be advantageous to use a different sublayer name to apply to these higher level PMA layers. Each separate PMA that is distinct from the PMA/PMD should be allocated a device address.

Therefore device address 8 will be PMAx-1 the lowest PMAx layer; device address 9 will be PMAx-2 the next lowest PMAx layer and device address 10 will be PMAx-3 the next PMAx layer. The editor believes that 4 total PMA layers will be sufficient.

The PMAx layers will share the same register addresses and definitions as each other. Only functions that are required to be separate from the PMD/PMD will be defined in the PMAx layers (e.g. loopback). Clearly there will be need for careful review of the register set that is included for PMAx layers.

On a practical note - it can be expected that silicon manufacturers will offer select pins or other means to allow system developers to use silicon devices to perform PMAx functions in a flexible manner.

Align with Clause 83 per comment responses (#157 etc).

dawe_04_1108 addresses this comment.
I doubt that errata for all the world's standards are available at this URL.

**Suggested Remedy**
Change 'all other standards' to 'all other IEEE standards'

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

**ACCEPT.**

The copper-cable receivers are expected to rely even more on long DFE than Backplane Ethernet, and so when errors happen, moderately long error bursts are very probable. This overwhelms the CRC's error-detecting guarantee. These port types do not go into closed systems as Backplane Ethernet ports do, so the standard has to take responsibility for avoiding false packet acceptance rather than the system implementer.

**Suggested Remedy**
FEC encoding and error detection must be mandatory, to provide adequate error detection. This is significantly less onerous than requiring mandatory full FEC error correction (correcting errors is a step beyond detecting them) which can remain optional.

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

**REJECT.**

More work is needed to determine whether MTFPA is a real issue with DFE. This work is going to be done in the logic track.

**Suggested Remedy**
Ask P802.3av for it

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

**ACCEPT IN PRINCIPLE.**

- Fix typos as suggested
- Update clause numbers for .3av as suggested
- Check and update formatting as appropriate.
- Also update second sentence of 802.3az to: "This amendment includes PHY enhancements for a selected set of PHY types to improve energy efficiency.."
- Also update second sentence of 802.3ba to: "..and adds Clause 80 through Clause 88..

**Suggested Remedy**
conciously

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

**ACCEPT.**

Confirmed that the page used is the latest
84.8 refers to 72.7, which says ‘...the PMD sublayer is standardized at test points TP1 and TP4 as shown in Figure 72-1. The electrical path from the transmitter block to TP1, and from TP4 to the receiver block, will affect link performance and the measured values of electrical parameters used to verify conformance to this standard. Therefore, it is recommended that this path be carefully designed.’ In other words, there is no expectation that a board from vendor A, a backplane from B and another board from C can be expected to interoperate reliably, because each of them can spend as much of the shared channel budget as he pleases. This is not an interoperability spec, it’s just an advertisement for some ICs. Is this what we want?

Suggested Remedy
Discuss. Options are: make it into a proper interoperability spec with test points related to the connectors (Clause 86 will have to do much of that work anyway), delete the clause, move it to an annex, or accept that it’s not a proper spec.

Response
REJECT.

In the event that the TF decides to change the definition in Clause 74 to allow "partial FEC"
then ability and control bits will be added to Clause 45.

See comment #322 which was rejected.

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<tr>
<th>Cl</th>
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<tr>
<td>45</td>
<td>45.2.1.84</td>
<td>T</td>
<td>A</td>
<td>Need a shorter name than 'Backplane/Copper/TBD FEC'. Something neutral as to application, which may evolve over the months and years.</td>
<td>K-FEC?</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
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</table>

See comment #439

Comments # 377, 443, 461 all raise this issue. See comment 439 for register naming changes to clause 45.

<table>
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<tr>
<td>74</td>
<td>74.8</td>
<td>T</td>
<td>A</td>
<td>PMA/PMD register names (&quot;Backplane FEC&quot;) do not match Clause 45 (&quot;Backplane/Copper/TBD FEC&quot;) in this draft. The former is too specific, the latter is too long. Need a shorter name: something neutral as to application, which may evolve over the months and years.</td>
<td>K-FEC?</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
</tr>
</tbody>
</table>

Comments # 377, 443, 461 all raise this issue. See comment 439 for register naming changes to clause 45.

<table>
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</thead>
<tbody>
<tr>
<td>80</td>
<td>80.1.3</td>
<td>T</td>
<td>A</td>
<td>'It is important to note that': is just padding. If it didn't matter, we wouldn't say it.</td>
<td>Delete</td>
<td>ACCEPT.</td>
<td></td>
</tr>
</tbody>
</table>

This issue was also discussed during 802.3 maintenance. All the layer diagrams in 802.3ba have been updated for consistency with the base spec.
In Table 87-13, Optical return loss is TBD dB
Limiting factor here is round trip reflections leading to coherent interference at the receiver.
Optical return loss 26dB or greater is consistent with Clause 52.10GBASE-ER Fibre optic cabling channel characteristics; with a transmitter reflectance of -12dB max, this would keep penalties due to round trip coherent interference down to approx 0.25dB

also applies to Table 88-176

Suggested Remedy
Last row of Table 87-13 becomes

Optical return loss (min) 26 dB

Last row of Table 87-13 becomes

Optical return loss (min) 26 26 26 dB

Response
ACCEPT IN PRINCIPLE.

Set values to 21 dB as per comment 487 and consistent with Clause 52.7.1

The TBDs in 86.10.2.2.1 are inconsistent with the standard cabling model shown in Fig 86-5

Suggested Remedy
Make text consistent with other SR applications. Paragraph should become:
The maximum link distances for multimode fiber are calculated based on an allocation of 1.5 dB total connection and splice loss. For example, this allocation supports 2 connections with an average insertion loss per connection of 0.75 dB. Connections with different loss characteristics may be used provided the requirements of Table 86-17 and Table 86-18 are met.

Response
ACCEPT IN PRINCIPLE.

Change paragraph to:
The maximum link distances for multimode fiber are calculated based on an allocation of 1.5 dB total connection and splice loss. For example, this allocation supports 2 connections, each with an insertion loss of 0.75 dB. Connections with different loss characteristics may be used provided the requirements of Table 86-17 and Table 86-18 are met.

See also comment # 348.
Cl 87 SC 87.7.2 P 233 L 42 # 383

King, Jonathan Finisar

Comment Type T Comment Status A Test Patterns
paragraph requires a valid 40GBASE-R signal; should also allow an appropriate test pattern to be used.
(the note in 87.7.1 says test patterns are not valid 40GBASE-R signals)
also applies to 88.8.2

Suggested Remedy
add text to end of paragraph:
‘... valid 40GBASE-R signal, or test pattern referenced in Table 87-10.’
similar remedy for 88.8.2

Response Response Status C
ACCEPT IN PRINCIPLE.
See also comment 490, 499

Change "modulated using a valid 40GBASE-R signal."
"to "modulated using the test pattern defined in Table 87-10."
Change the relevant TBD in Table 87-10 to "TBD or valid 40GBASE-R signal"
For resolution of text in clause 88.8.2 see comment 507
See also comments 484, 490, 499 and 510

Cl 87 SC 87.7.1 P 233 L 31 # 384

King, Jonathan Finisar

Comment Type T Comment Status A Test Patterns
No Table of Test Patterns

........................................
also applies to Clause 88

Suggested Remedy
Insert table similar to Table 52-21-Test patterns in clause 52
into section 87.7.1 and 88.8.1
with:
Pattern 1 TBD
Pattern 2 TBD
Pattern 3 PRBS31b PRBS31c

and notes under table as:
aThis pattern is defined in TBD.
bThis is the test-pattern checker defined in 49.2.12.
cThis is the test-pattern checker defined in 50.3.8.2.

Response Response Status C
ACCEPT IN PRINCIPLE.

Insert tables in clauses 87.7.1 and 88.8.1 with contents consistent with resolutions of other comments on test patterns and with licence to the editors on the format.
### IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

#### Task force Review

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<td>86</td>
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<td>50</td>
<td>King, Jonathan Finisar</td>
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<tr>
<td>387</td>
<td>87</td>
<td>233</td>
<td>36</td>
<td>King, Jonathan Finisar</td>
</tr>
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</table>

**Comment Type:** T
**Comment Status:** A
**Comment:**
Generic eye mask measurement details missing.

**Suggested Remedy:**
Use text from 802.3aq (Clause 68.6.5) describing finite hit rate eye mask measurements.

**Response:**

**Response Status:** C

ACCEPT IN PRINCIPLE.

Apply the changes in anslow_07_1108.pdf except for:

- "In Table 86-8 set \{X1, X2, X3, Y1, Y2, Y3\} to \{0.25, 0.40, 0.45, 0.25, 0.28, 0.40\} with editor's note that the numbers are provisional." which leaves the eye mask in Table 86-8 "TBD"

- Also add a second editor's note under the existing note in 86.7.4.7 to say "an absolute eye mask is being considered as the aggregate signal parameter for 40GBASE-SR4 and 100GBASE-SR10 replacing the relative mask defined in clause 86.7.4.7"

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<td>87</td>
<td>234</td>
<td>37</td>
<td>King, Jonathan Finisar</td>
</tr>
</tbody>
</table>

**Comment Type:** T
**Comment Status:** A
**Comment:**
The optical filter is undefined

**Suggested Remedy:**
Add wording extracted from Editors note (p234 line 42ff), and reference to G959.1:

- The optical filter passband ripple shall be limited to 0.5 dB and the isolation is chosen such that the ratio of the power in the lane being measured to the sum of the powers of all of the other lanes is greater than 20 dB (See G959.1 Annex B).

- and remove Editors note

**Response:**

**Response Status:** C

ACCEPT IN PRINCIPLE.

Add the text "The optical filter passband ripple shall be limited to 0.5 dB and the isolation is chosen such that the ratio of the power in the lane being measured to the sum of the powers of all of the other lanes is greater than 20 dB (See ITU-T G.959.1 Annex B)."

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<td>388</td>
<td>87</td>
<td>233</td>
<td>42</td>
<td>King, Jonathan Finisar</td>
</tr>
</tbody>
</table>

**Comment Type:** TR
**Comment Status:** A
**Comment:**
OSA resolution is TBD

**Suggested Remedy:**
Replace TBD with 0.1nm

**Response:**

**Response Status:** C

ACCEPT IN PRINCIPLE.

Change "An optical spectrum analyzer (OSA) or equivalent instrument is used, with the resolution bandwidth of TBD, and the lane under test is modulated using a valid 40GBase-R signal." to

"An optical spectrum analyzer (OSA) or equivalent instrument is used and the lane under test is modulated using a valid 40GBase-R signal."

Make the same change in 88.8.2
Comment Type: TR  Comment Status: A
Table 86-6
Eye mask coordinates: X1,X2,Y1,Y2 and conditions contain TBDs.

SuggestedRemedy
Use SFP+MSA mask and coordinates for TP1

Eye mask coordinates: X1,X2,Y1,Y2 become 0.12, 0.33, 95, 350
Condition becomes <5e-5 hit rate.

Response  Response Status: C
ACCEPT IN PRINCIPLE.

A show of hands was taken as to whether to accept this proposal:
Yes 10
No 2

Eye mask coordinates: X1,X2,Y1,Y2 become 0.12, 0.33, 95, 350
Condition becomes <5e-5 hit ratio.

See also comments # 403, 390, 404.

Comment Type: T  Comment Status: A
Aggregate
There is a proposal for Table 86-8 to use the Tx eye mask as the aggregate test. If accepted subclause 86.7.4.6 can be deleted.

SuggestedRemedy
If proposal for Table 86-8 to use the Tx eye mask as the aggregate test is accepted, delete subclause 86.7.4.6.

Response  Response Status: C
ACCEPT IN PRINCIPLE.

This comment would need to be re-submitted if an aggregate signal parameter is accepted in to the draft.

Comment Type: E  Comment Status: A
The phrase, the four or ten, is introduced and used in several places. Previously, page 199, line 30, the term, n + 1, is used and is more succinct.

SuggestedRemedy
Except for page 199, replace all instances of the phrase, the four or ten, with n + 1.

Response  Response Status: C
ACCEPT IN PRINCIPLE.

Deleted a few "four or ten"s and one erroneous n.
Comment Type: T  Comment Status: A  Skew
The attribute skew is not defined nor does there appear a defined measurement. While this may not be essential in the logical domain, where dynamic skew is being considered and the signals are electrical or optical, it appears important to define skew such that jitter is not included.

Suggested Remedy:
Add a skew measurement sub-clause to Clause 86.7 such that jitter is not captured in the skew measurement.

Response:
Response Status: C  ACCEPT IN PRINCIPLE.

Insert a new subclause to define the measurement of skew and dynamic skew on multimode fibers containing an editor's note as a placeholder including the principle that the dynamic skew does not double count jitter and that the definition of skew in Clause 82.2.9 may need to be modified.

Also add a new subclause to Clause 87 to define the measurement of skew and dynamic skew for a WDM based PMD containing an editor's note as a placeholder.

Also add a new subclause to Clause 88 referring to the measurement definition in Clause 87.

Comment Type: T  Comment Status: R
In Table 86-7, the min entry for Total Jitter tolerance at TP1a has a value of 0.3. This has insufficient precision for jitter since it permits a range of 0.25 to 0.349. All jitter entries should have, at least, two significant digits.

Suggested Remedy:
In Table 86-7, change the min entry for Total Jitter tolerance at TP1a from 0.3 to 0.30.

Response:
Response Status: C  REJECT.

See response to comment # 394.

Comment Type: T  Comment Status: A  Aggregate
Including the phrase, "power in OMA" in the sentence, "A signal with power in OMA and average power not within the ranges given cannot be compliant." is not applicable if OMA is deleted from Table 86-8 or is changed to informative.

Suggested Remedy:
Change the sentence, A signal with power in OMA and average power not within the ranges given cannot be compliant, to, A signal with average power not within the ranges given cannot be compliant.

Response
Response Status: C  ACCEPT IN PRINCIPLE.

This comment would need to be re-submitted if an aggregate signal parameter is accepted in to the draft.
<table>
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<th>Comment Type</th>
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<th>Aggregate</th>
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</thead>
<tbody>
<tr>
<td>T</td>
<td>A</td>
<td>Aggregate</td>
</tr>
</tbody>
</table>

In Table 86-9, the characteristic, "Optical Modulation Amplitude (OMA), each lane", is not applicable if OMA is deleted from Table 86-8 or is changed to informative.

**Suggested Remedy**

In Table 86-9, delete the characteristic, "Optical Modulation Amplitude (OMA), each lane", if OMA is deleted from Table 86-8 or is changed to informative.

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

This comment would need to be re-submitted if an aggregate signal parameter is accepted in to the draft.

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<table>
<thead>
<tr>
<th>Comment Type</th>
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</thead>
<tbody>
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<td>T</td>
<td>R</td>
<td>Aggregate</td>
</tr>
</tbody>
</table>

In Table 86-10, Value entries for "Damage threshold" and "Average power at receiver input" show only a single significant digit and lack sufficient precision.

**Suggested Remedy**

In Table 86-10 change Value entries for "Damage threshold" and "Average power at receiver input" to show at least two significant digits as needed for the desired precision.

**Response**

**Response Status**: C

REJECT.

The number of significant digits does not indicate the precision of a limit in this standard. The limits are taken to be exact. For the damage threshold limit of +2 dBm, a value of 2.000001 would be compliant and a value of 1.999999 would not.

See also comment # 394.
There is a proposal for Table 86-8 to use the Tx eye mask as the aggregate test. Since this mask has an absolute values for the vertical coordinate, the sentence "Unlike the optical eye mask, the vertical dimensions are fixed rather than scaled to the signal." is no longer applicable.

**Suggested Remedy**
- If proposal for Table 86-8 to use the Tx eye mask as the aggregate test is accepted, delete the sentence "Unlike the optical eye mask, the vertical dimensions are fixed rather than scaled to the signal."

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

This comment would need to be re-submitted if an aggregate signal parameter is accepted in the draft.

In Table 86-6, there’s a TBD for eye mask coordinate X2 and another in the Conditions column.

**Suggested Remedy**
- In Table 86-6, replace the TBD for eye mask coordinate X2 with 0.25 and delete the TBD in the Conditions column or replace it with a reference to subclause 86.7.4.7.

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

See resolution to comment #389
See also comments #389, 390, 404.
<table>
<thead>
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<th>Comment ID</th>
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<tbody>
<tr>
<td>405</td>
<td>TR</td>
<td>A</td>
<td>In Table 86-8, the characteristics, Optical Modulation Amplitude (OMA), Optical Modulation Amplitude (OMA), Aggregate signal parameter, and RIN12OMA can be replaced by using the Transmitter eye mask as the aggregate signal parameter.</td>
</tr>
<tr>
<td>406</td>
<td>TR</td>
<td>A</td>
<td>In Table 86-8, delete or label as informative the characteristics, Optical Modulation Amplitude (OMA), Aggregate signal parameter, and RIN12OMA and use the Transmitter eye mask as the aggregate signal parameter.</td>
</tr>
<tr>
<td>407</td>
<td>TR</td>
<td>A</td>
<td>In Table 86-10, Value column entries are TBD for attributes, Stressed receiver sensitivity in OMA, Vertical eye closure penalty, and Stressed eye jitter J.</td>
</tr>
<tr>
<td>408</td>
<td>TR</td>
<td>C</td>
<td>In Table 86-11, add a header row to label the Transmitter eye mask coordinates as Specification values and has TBD as entries in the Type and Value columns and no entry in the Unit column.</td>
</tr>
</tbody>
</table>

**Suggested Remedy:**
- In Table 86-8, delete or label as informative the characteristics, Optical Modulation Amplitude (OMA), Aggregate signal parameter, and RIN12OMA and use the Transmitter eye mask as the aggregate signal parameter.
- In Table 86-10, Value column entries are TBD for attributes, Stressed receiver sensitivity in OMA, Vertical eye closure penalty, and Stressed eye jitter J.

**Response:**
- ACCEPT IN PRINCIPLE.
- Insert editor's note under the Table 86.10 to say: "Values of -5.4 dBm for Stressed receiver sensitivity in OMA, 1.67 dB for Vertical eye closure penalty and 0.37 UI Stressed eye jitter J have been proposed. Further information is invited."
In Table 86-12, there's a TBD for Eye mask coordinate X2 and another in the Conditions column.  
In Table 86-12, change the TBD for Eye mask coordinate X2 from TBD to 0.50 and either delete the TBD in the Conditions column or change to reference subclause 86.7.4.7.  

In Table 86-12, change the TBD for Eye mask coordinate X2 from TBD to 0.50.  Also reference subclause 86.7.4.7 in the conditions.  
See also comment # 408.

In Table 86-13 there's a TBD for Allocation for penalties.  
In Table 86-13 change the TBD for Allocation for penalties to 6.8.  
change the TBD for Allocation for penalties to 6.4.  
And see comment # 632.

In Table 86-13, change the TBD for Allocation for penalties to 6.8.  
change the TBD for Allocation for penalties to 6.4.  
And see comment # 632.

In Table 86-13, change the TBD for Allocation for penalties to 6.8.  
change the TBD for Allocation for penalties to 6.4.  
And see comment # 632.

Multiple comments # 135, 414, 201, and 550.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>415</td>
<td>E</td>
<td>A</td>
<td>per comment</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>416</td>
<td>E</td>
<td>R</td>
<td>per comment</td>
<td>REJECT.</td>
</tr>
</tbody>
</table>
| 417        | ER   | A              | Replace with "This amendment includes changes to IEEE Std 802.3-2008 and adds Clause 78."
|            |      |                |                  | ACCEPT.  |
| 418        | E    | R              | This text is consistent with rest of the sentence. | REJECT.  |
| 419        | E    | R              | Line 14, typo: change to "transmitter"
|            |      |                |                  | ACCEPT.  |
| 420        | E    | A              | Replace with "This amendment includes changes to IEEE Std 802.3-2008 and adds Clause 78."
<p>|            |      |                |                  | ACCEPT.  |</p>
<table>
<thead>
<tr>
<th>Comment ID</th>
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<th>P</th>
<th>L</th>
<th>Status</th>
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<tr>
<td>421</td>
<td>85</td>
<td>195</td>
<td>6</td>
<td>Cl</td>
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<td>422</td>
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<td>425</td>
<td>88</td>
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<tr>
<td>426</td>
<td>A</td>
<td>265</td>
<td>12</td>
<td>Cl</td>
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</table>

Comment Details:
- **85.11.2**: Typo, change to "considered". Suggested Remedy: ACCEPT.
- **87.7.1**: Double period (..), delete one period at the end of the Note. Suggested Remedy: per comment. Response: ACCEPT IN PRINCIPLE.
- **87.7.5.4**: Typo, change to "separate". Suggested Remedy: per comment. Response: ACCEPT IN PRINCIPLE. Changed to "separate". See also comment #179.
- **88.8.1**: Double period (..), delete one period at the end of the Note. Suggested Remedy:ACCEPT.
- **88.8.5.4**: Typo, change to "separate". Suggested Remedy: per comment. Response: ACCEPT IN PRINCIPLE. Changed to "separate". See also comment #179.
- **A**: Line 12, typo change to "Alphabetical". Line 19, extra space, change to "2008." Suggested Remedy: per comment. Response: ACCEPT.
<table>
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<tr>
<th>Comment ID</th>
<th>SC</th>
<th>Subsection</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>427</td>
<td>69A</td>
<td>69A.3</td>
<td>271</td>
<td>21</td>
<td>E</td>
<td>A</td>
<td>typo, change to &quot;tolerance&quot; per comment ACCEPT.</td>
</tr>
<tr>
<td>428</td>
<td>00</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>E</td>
<td>A</td>
<td>Page1, Line 2, 30: Typo, change &quot;Amendement&quot; to &quot;Amendment&quot; Page3, Line 8: Typo, change &quot;conciously&quot; to &quot;consciously&quot; page 3, line 10: typo, change consecutively to consecutively page 3, line 37, typo, change to &quot;superseded&quot; page 3, line 52, two periods, remove one period at end of sentence As per comment ACCEPT.</td>
</tr>
<tr>
<td>429</td>
<td>01</td>
<td>1.1.3.2</td>
<td>22</td>
<td>22</td>
<td>E</td>
<td>A</td>
<td>&quot;CGMII is is&quot;: delete one &quot;is&quot; As per comment ACCEPT.</td>
</tr>
<tr>
<td>430</td>
<td>45</td>
<td>45.2.1.8</td>
<td>35</td>
<td>9</td>
<td>E</td>
<td>A</td>
<td>Fix typo &quot;usee&quot; to &quot;use&quot; Per comment ACCEPT.</td>
</tr>
<tr>
<td>431</td>
<td>45</td>
<td>45.2.1.86</td>
<td>47</td>
<td>2</td>
<td>E</td>
<td>A</td>
<td>Double period (.,) delete a period As per comment ACCEPT.</td>
</tr>
<tr>
<td>432</td>
<td>45</td>
<td>45.2.3</td>
<td>48</td>
<td>10</td>
<td>E</td>
<td>A</td>
<td>Table 45-82 is incomplete - there are more elements in the base document that are not shown here. Show table elements from the base document or ellipses where blocks are omitted. As per comment ACCEPT.</td>
</tr>
<tr>
<td>433</td>
<td>74</td>
<td>74.7.4.5</td>
<td>79</td>
<td>39</td>
<td>E</td>
<td>A</td>
<td>The editor's note is no longer required. Delete the editor's note ACCEPT.</td>
</tr>
</tbody>
</table>
Cl 82 SC 82.2.8 P 125 L 26 # 434
Barrass, Hugh Cisco

Comment Type E Comment Status A
It's not really a "regular 66-bit block" since it doesn't use a defined 64B/64B code.

SuggestedRemedy
Change "regular 66-bit block" to "specially defined 66-bit block"

Response Response Status C
ACCEPT.

Cl 82 SC 82.2.9 P 126 L 47 # 437
Barrass, Hugh Cisco

Comment Type E Comment Status A
"on lane 0 bits 0 to 65 are sent"
This paragraph written by Yoda was...
Change to a more traditional word order

SuggestedRemedy
Change
"on lane 0 bits 0 to 65 are sent, on lane 1 bits 66 to 131 are sent; on lane 2 bits 132 to 197 are sent, on lane 3 bits 198 to 263 are sent, then on lane 0 bits 264 to 329 are sent etc."

to
"bits 0 to 65 are sent on lane 0, bits 66 to 131 are sent on lane 1; bits 132 to 197 are sent on lane 2, bits 198 to 263 are sent on lane 3, then bits 264 to 329 are sent on lane 0 etc."

With similar changes to the following paragraph for 100G.

Response Response Status C
ACCEPT IN PRINCIPLE.

Nice Star Wars reference, I agree it makes sense to change the order.

Cl 82 SC 82.2.9 P 126 L 49 # 435
Barrass, Hugh Cisco

Comment Type E Comment Status A
"that looks random and has lots or transitions"
Apart from the obvious typo, this phrase does not seem right - what does it mean to "look random?"

SuggestedRemedy
Change "that looks random and has lots or transitions" to "that is defined to be balanced and irregular with many transitions"

Response Response Status C
ACCEPT IN PRINCIPLE.

Change "that looks random and has lots or transitions" to "that is defined to be balanced and with many transitions"

Cl 82 SC 82.2.10 P 128 L # 438
Barrass, Hugh Cisco

Comment Type E Comment Status A
"sends 4 bits at a time" implies that the bits are sent as a vector.

SuggestedRemedy
Change:

it sends 4 bits (for 40GBASE-R) or 20 bits (for 100GBASE-R) of test pattern at a time

to

it sends the test pattern in 4 separate data streams (for 40GBASE-R) or 20 separate data streams (for 100GBASE-R)

Response Response Status C
ACCEPT.
The use of "Backplane/Copper/TBD" is particularly ugly. The TF needs to settle on a
vargae and stick to it. It doesn't need to be perfect - exceptions and usage changes can
always be noted where required.

All of the usage in 802.3ba is BASE-R copper so that usage seems to be the most
obvious. There may be some small exceptions for non BASE-R backplane (I haven't
checked all the details) but these can be covered with specific notes. Future BASE-R
copper may not use the same registers, but that bridge can be crossed when (if) we reach
it.

Suggested Remedy
Change "Backplane/Copper/TBD" to "BASE-R copper"

Table 45-3 and all related 45.2.1 register definitions.
The footnote below Table 45-3 can be retained (with the name change). The verbage at the
beginning of each register definition should mimic the footnote.

Remove the editor's note.

Response
ACCEPT IN PRINCIPLE.

Change "Backplane/Copper/TBD" to "BASE-R"

Table 45-3 and all related 45.2.1 register definitions.
The footnote below Table 45-3 can be retained (with the name change). The verbage at the
beginning of each register definition should mimic the footnote.

Remove the editor's note.
The editor's note notwithstanding, the paragraph needs rewording (because it's ugly!) and more importantly, the following paragraph regarding operation over multilane media must be changed.

**Suggested Remedy**

Delete the editor's note and the paragraph in the existing draft. Replace with:

Change text as follows (underlines & strikeouts will need to be added by the editor):

DME pages can be transmitted by local devices capable of operating in 1 Gb/s, 10Gb/s, 40Gb/s and 100Gb/s; using 1, 4 or 10 lanes.

73.5.1.1 DME electrical specifications

Change text as follows:

Transmitter characteristics shall meet the specifications in Table 73-1 at TP1 while transmitting DME pages. Receiver characteristics shall meet the specifications in Table 73-1 at TP4 while receiving DME pages.

For any multi-lane PHY, DME pages shall be transmitted only on lane 0. The transmitters on other lanes should be disabled as specified in 71.6.7.

**Response**

ACCEPT IN PRINCIPLE.

Delete the editor's note and the following paragraph as this text is redundant.

Renumber 73.5.1.1 to 73.5.1 and use the title "DME electrical specifications"

Implement the commenter's suggested remedy for 73.5.1.1 using appropriate underlines & strikeouts

**Comment Status** A

**Response Status** C
This clause reproduces most of Clause 49 without any reference to that clause. There are a number of reasons why this is a bad idea.

Firstly, it allows the definition of the 64B/66B PCS to diverge more than necessary for the development of 40 & 100G. This may cause problems, especially with developers who are planning to reuse parts of their 10GBASE-R designs for 40G or 100G. Subtle differences between the clauses will not easily be noticed. This may be particularly difficult for developers of multi-rate implementations (e.g. 4 x 10G that also supports 40G - or other combination silicon development).

It also wastes time reviewing and commenting on pages of specification that are already in the standard. Not to mention that LOAs may have to be resubmitted for IP that is already in Clause 49.

Suggested Remedy
Rewrite the clause so that copied text is referenced and only the changes and additions are included in this clause.

The commenter will supply complete text if required (based on the existing Clauses 49 and 82).

Response
ACCEPT IN PRINCIPLE.

Some subclauses that are unchanged are:
82.2.6, 82.2.14, figure 82-16 (PCS tx SM).
I propose that clause 82 just refer back to 49 for these.

All other subclauses that I saw have some differences. Figure 82-17 has just one minor difference for the entry requirements for RX_INIT, not sure how I would best address cases like this?
Changing many of the subclauses to refer back to clause 49 and then adding a number of changes seems to me that it will reduce the readability.

The phrase "sends four bits of transmit data at a time" implies that the PCS is sending a 4 bit vector. This is not the case, it is sending 4 data streams.

Also, is there a reason why "four" is spelt out and "20" is not?

Suggested Remedy
Change "sends four bits of transmit data at a time" to "sends four data streams"

Also change "sends 20 bits of transmit data at a time" to "sends twenty data streams"

Response
ACCEPT.

The Test-pattern generators description is incomplete - when compared to the source in Clause 49.
It does not describe how the seed is placed in the scrambler, inverted etc.

Suggested Remedy
The full text of 49.2.8 needs to be copied in, then the references to the square wave and PRBS sequences removed.

Most of 49.2.8 is not applicable. Comment #90 adds in more detail about the pattern (idle control). There are no plans to have invert patterns etc. Here is one clarification that might help people understand the differences between clause 49 and this clause:
From:
"When pseudo-random pattern is selected, the test pattern is generated by the scrambler using a random seed loaded through the MDIO registers.
To:
"When pseudo-random pattern is selected, the test pattern is generated by the scrambler. No seeding of the scrambler is required during test pattern operation."
IBTA has selected the CXP connector currently specified as Version 0.3 - Oct. 2, 2008 "120 Gb/s 12x Small Form-factor Pluggable (CXP) Interface Specification for Cables, Active Cables, & Transceivers". Replace SFF-8002 with the IBTA selected connector SFF-8642 which has been the stated intent (diminico_02_0708.pdf).

Suggested Remedy
Page 195 line 6 replace SFF-8092 with SFF-8642.

Response
ACCEPT.

The maximum insertion loss (in dB with f in MHz) for the transmitter and receiver differential controlled impedance printed circuit boards for each differential lane shall be:

\[
\text{Insertion Loss}(f) \leq (0.2032) \times 20 \log(e) \times (2.00E-05 \sqrt{f \times 10^6} + 1.1E-10(f \times 10^6) + 3.2E-20((f \times 10^6)^2 + 1.2E-30(f \times 10^6)^3)) \text{ TBD dB}
\]

for all frequencies from 100 MHz to 6000 MHz.

Insertion Loss(f) represents 8 inches (0.2032 m) of the maximum fitted attenuation (Amax) due to trace skin effect and dielectric properties as defined in Annex 69B.4.2.

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

Cl 85 SC 85.9 P 184 L 6 # 449
DiMinico, Christopher MC Communications

Comment Type T  Comment Status A
Update Table 85-6-Cable assembly differential characteristics based on accepted cable assembly TBD values and additions/deletions of cable assembly parameters.

SuggestedRemedy
Editor to update Table 85-6-Cable assembly differential characteristics' summary with accepted cable assembly TBD values and additions/deletions of cable assembly parameters.

Response Response Status C
ACCEPT.

[Editor's note: added missing subclause number 85.9 to subclause field]

DiMinico, Christopher MC Communications

Cl 85 SC 85.7.1 P 177 L 22 # 450

Comment Type TR  Comment Status A
Add channel test/reference points TP0 and TP5 to Figure 85-2 to provide channel definition demarcation points for tests and/or references.

SuggestedRemedy
Add channel test/reference points TP0 and TP5 to Figure 85-2.

Response Response Status C
ACCEPT.

[Editor's note: Corrected/replaced figure number in subclause field to 85.7.1]

DiMinico, Christopher MC Communications

Cl 85 SC 85.7.1 P 177 L 5 # 451

Comment Type TR  Comment Status A
Add text for inclusion of TP0 and TP5 in subclause 85.7.1.

SuggestedRemedy
Delete text: The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter and receiver blocks to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85-2.

Add text: The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter (TP0) and receiver blocks (TP5) to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85-2.

TP0 and TP5 are reference points that may not be testable in an implemented system.

Response Response Status C
ACCEPT.

DiMinico, Christopher MC Communications

Cl 85 SC 85.7.1 P 177 L 5 # 451

Comment Type TR  Comment Status A
Add text: The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter (TP0) and receiver blocks (TP5) to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85-2.

Add text: The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter (TP0) and receiver blocks (TP5) to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85-2.

TP0 and TP5 are reference points that may not be testable in an implemented system.
DiMinico, Christopher
McCommunications

Add channel subclause before cable assembly subclause and move 85.10 (Tx_pcb and Rx_pcb IL) under channel subclause to provide hierarchical structure to specification consistent with channel/link topology.

Suggested Remedy

1. Add channel subclause before cable assembly subclause - Page 183, Line 49;
   >>85.x Channel
   The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter and receiver blocks to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85-2.
   "Delete page 191, line 16-34 and move deleted text as new subclause under new channel subclause 85.x"

Response

ACCEPT.

Response Status C

(Editor's note: added missing subclause number 85.9 to subclause field)

1. Add channel subclause before cable assembly subclause - Page 183, Line 49;
   >>85.x Channel
   The 40BASE-CN4 and 100BASE-CN10 channel is defined between the transmitter and receiver blocks to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85-2.
   "Delete page 191, line 16-34 and move deleted text as new subclause under new channel subclause 85.x"

Response

ACCEPT.

Response Status C

Define NEXT and MDNEXT to be used in the ICR calculation and remove individual limit specifications. The use of independent limit lines for each disturber is unnecessary as the individual impairments are not uniquely distinguished i.e., they are combined on a power sum basis to limit crosstalk in relation to insertion loss.

Suggested Remedy

1. Delete lines 48-54 page 186.
2. Delete equation (85-4) page 187. Delete lines 4-5 page 187.
3. Add text under 85.9.4.1 Differential Near-End Crosstalk: Since four or ten transmit and four or ten receive lanes are used to transfer data between PMDs, the NEXT that is coupled into a receive lane will be from the four or ten transmit lanes.
4. Delete lines 8-9 page 187.
5. Since four or ten transmit and four or ten receive lanes are used to transfer data between PMDs, the NEXT that is coupled into a receive lane will be from the four or ten transmit lanes.
7. Delete lines 1-28 page 188.

Response

ACCEPT.

Response Status C
Define FEXT and MDFEXT to be used in the ICR calculation and remove individual limit specifications. The use of independent limit lines for each disturber is unnecessary as the individual impairments are not uniquely distinguished i.e., they are combined on a power sum basis to limit crosstalk in relation to insertion loss. In addition, ELFEXT is unnecessary as ICR enables crosstalk to insertion loss tradeoff.

Suggested Remedy:
1. Delete lines 30-54 page 188.
2. Delete lines 1-5 page 189.
3. Add text line 31 page 188 >> Since four lanes or ten lanes are used to transfer data between PMDs, the FEXT that is coupled into a data carrying lane will be from the three other lanes or nine other lanes in the same direction.
4. Remove equal level line 6 page 189 in subclause title.
5. Replace ELFEXT with FEXT 85.9.5.2 Multiple Disturber Far-End Crosstalk (MDFEXT) loss and globally.
6. Delete lines 8-9 page 189.
7. Delete lines 13-54 page 189.

Response
ACCEPT IN PRINCIPLE.
1. Delete lines 30-54 page 188.
2. Delete lines 1-5 page 189.
3. Add text line 31 page 188 >> Since four lanes or ten lanes are used to transfer data between PMDs, the FEXT that is coupled into a data carrying lane will be from the three other lanes or nine other lanes in the same direction.
4. Remove equal level line 6 page 189 in subclause title.
5. Replace ELFEXT with FEXT 85.9.5.2 Multiple Disturber Far-End Crosstalk (MDFEXT) loss and globally.
6. Delete lines 8-9 page 189.
7. Delete lines 13-54 page 189.

Editor note: include near power sum equation - need to consider need for voltage sum.
Add text: Assuming ICR is computed at N uniformly-spaced frequencies fn spanning the frequency range 100 MHz to 5156.25 MHz, ICRfit may be computed using Equations (85-x) through (85-x); utilize Equations (69B-19) through (69B-23).

Add text: ICRfit shall be greater than or equal to ICRmin as defined by the following equation: Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

Add equation: ICRfit(f) >/= ICRmin(f) = 23.3 - 18.7*LOG((f*10^6)/(5*10^9)) (TBD) dB

Add Figure to illustrate insertion loss to crosstalk ratio limit.

Note: 2.5 dB of the 3 dB signal-to-noise ratio penalty related to insertion loss deviation embodied in 802.3ap ICRmin is applied as 2.5 dB ICRmin margin to account for reduction in ILD penalty for CR4 and CR10

Add new subclause below 85.9.x Cable assembly power sum differential crosstalk

The channel insertion loss to crosstalk ratio (ICR) is the ratio of the channel insertion loss to the total channel crosstalk loss determined using Equation (89.xx). Add text: Assuming ICR is computed at N uniformly-spaced frequencies fn spanning the frequency range 100 MHz to 5156.25 MHz, ICRfit may be computed using Equations (85-x) through (85-x); utilize Equations (69B-19) through (69B-23).

Add text: ICRfit shall be greater than or equal to ICRmin as defined by the following equation: Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

Add equation: ICRfit(f) >/= ICRmin(f) = 23.3 - 18.7*LOG((f*10^6)/(5*10^9)) (TBD) dB

Add Figure to illustrate insertion loss to crosstalk ratio limit.
Comment Type: TR

Comment Status: A

Suggested Remedy:
Add cable assembly ILD specifications to limit cable assembly ILD. Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

Suggested Remedy:
Add subclause page 185 line 50 85.9.x Cable assembly insertion loss deviation
Insert text under subclause
The cable assembly insertion loss deviation is the difference between the cable insertion loss and the fitted insertion loss determined using Equation (85-x).

ILD(f) = IL(f) - ILfitted(f) (85-x)

The fitted insertion loss is determined using Equations (85.xx)-(85.xx); use 69B-1 to 69B-5 for (85.xx)-(85.xx) replacing A(f) with ILfitted(f). Add TBDs beside equations to indicate that an alternate to the least mean square line fit to the cable assembly IL is under consideration.

The ILD shall be within the region bounded by the following equations:
ILDmax= 0.7(TBD) + 0.2(TBD)*10^-9*(f*10^6) TBD dB
ILDmin= -0.7(TBD) + 0.2(TBD)*10^-9*(f*10^6) TBD dB

1000 MHz ≤ f ≤ 6000 MHz

Response: C

ACCEPT IN PRINCIPLE.

[Editor's note: added missing subclause number 85.9 to subclause field]

Fixed typo in equation:
From: ILDmin= -0.7(TBD)+0.2(TBD)*10^-9*(f*10^6) TBD dB
To: ILDmin= -0.7(TBD)+0.2(TBD)*10^-9*(f*10^6) TBD dB
85.9.3 Cable assembly return loss

The return loss (in dB with f in MHz) of each pair of the 40GBASE-CR4 and 100GBASE-CR10 cable assembly shall be:

\[ \text{Return}_{\text{loss}}(f) = 10 \text{ dB} \]
for 100 MHz \(\leq f < 4000 \text{ MHz}\)

\[ \text{Return}_{\text{loss}}(f) = 10 - 10 \log(f/4000) \]
for 4000 MHz \(\leq f \leq 10000 \text{ MHz}\)

Figure 85-5-Minimum cable assembly return loss (informative) to be provided in attachment.

Response

ACCEPT IN PRINCIPLE.

85.9.3 Cable assembly return loss

The return loss (in dB with f in MHz) of each pair of the 40GBASE-CR4 and 100GBASE-CR10 cable assembly shall be:

\[ \text{Return}_{\text{loss}}(f) \geq 10 \text{ dB} \]
for 100 MHz \(\leq f < (\text{TBD}) < 4000 \text{ MHz}\)

\[ \text{Return}_{\text{loss}}(f) = 10 - 10 \log((f/4000)\text{TBD}) \]
for \(\text{TBD} < f \leq 10000 \text{ MHz}\)

Table 74-1 register names are "Backplane" but they are named "Backplane/Copper/TBD" in Clause 45. This is just a reminder that resolving the naming issue in Cl45 also applies to Table 74-1.

SuggestedRemedy

Apply resolution of Table 45-3 "Backplane/Copper/TBD" naming issue to Table 74-1.

Response

ACCEPT.

Comments # 377, 443, 461 all raise this issue
There is unnecessary distinution between CR4 and KR4 in autonegotiation.
In Table 45-3 (PMA/PMD registers) we have already set the precedent that backplane and copper registers should be kept common as much as feasible. We should continue this practice.
Propose combining KR4 and CR4 Technology Ability fields, priority resolution, and state variables as indicated in Remedy.
Beyond simplicity there is a problem with advertising CR4 & KR4 in separate bits and allowing them both to be set. In this case the the underlying PHY cannot distinguish if the media is backplane or copper. The Priority Resolution Table says to pick CR4, but the media may actually be a backplane, so the result would be to indicate a CR4 resolution when it is actually KR4... and it doesn't matter. Combine the bits.

**Suggested Remedy**
Table 73-1: Rename bit A3 "40GBASE-KR4/CR4" Reclaim the remaining bits by naming A4 as CR10 & returning A5 to reserved.

Table 73-2: Combine CR4 and KR4 into the same resolution priority level.

subclause 73.10.1: 40GKR4 and 40GCR4 into the same variable. Either pick one of the two existing variable names, or make a combined name like "40GCKR4". Change the description to "represents that the 40GBASE-KR4 or 40GBASE-CR4 PMA is the signal source"

subclause 73.10.1: definition of single_link_ready: combine CR4 & KR4 (5 & 6) into one line: "5) link_status_[40GCKR4] = OK" as appropriate for the variable name used above.

Table 45-142 (and subclause 45.2.7.12.2): combine autoneg resolution for CR4 and KR4 into the same variable, since autoneg cannot distinguish. Change the bit 5 description to read "...is negotiated to perform 40GBASE-KR4 or 40GBASE-CR4" (The name for this bit can be resolved in the future to be consistent with the "Backplane/Copper/TBD" names that need to be resolved elsewhere in the draft.)

**Response**
ACCEPT IN PRINCIPLE.
The CR4 and KR4 PMDs have different electrical specifications so the distinction is necessary.
Therefore reject suggested remedy to make these equivalent.
The commenter makes a valid point that a system should never advertise capability for both CR4 and KR4 simultaneously.
Add a note to say that CR4 and KR4 should not be advertised simultaneously.
### Type and Comment Details

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<td>P39</td>
<td>L33</td>
<td>Dudek, Mike JDSU</td>
<td>T</td>
<td>A</td>
<td>Clause 72 is not being changed in this draft (including no change in title). It doesn't make sense to be changing this subclause if Clause 72 PMD's are the only ones being used and clause 72 is the single PMD 10GBASE-KR (ie Clause 72 is not being changed to include reference to other PMD's than 10GBASE-KR). Otherwise the ISO reference models in the other clauses should indicate 10GBASE-KR as the PMD layer.</td>
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<tr>
<td>#465</td>
<td>P85</td>
<td>L15</td>
<td>Dudek, Mike JDSU</td>
<td>E</td>
<td>A</td>
<td>typo</td>
</tr>
<tr>
<td>#466</td>
<td>P87</td>
<td>L18</td>
<td>Dudek, Mike JDSU</td>
<td>T</td>
<td>A</td>
<td>The wording in this paragraph implies that shorter cables are not compliant.</td>
</tr>
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</table>

### Task Force Review

- **Comment ID #464**
  - **Comment Type**: T  
  - **Comment Status**: A  
  - **Comment Text**: Clause 72 is not being changed in this draft (including no change in title). It doesn't make sense to be changing this subclause if Clause 72 PMD's are the only ones being used and clause 72 is the single PMD 10GBASE-KR (ie Clause 72 is not being changed to include reference to other PMD's than 10GBASE-KR). Otherwise the ISO reference models in the other clauses should indicate 10GBASE-KR as the PMD layer.

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

- **Suggested Remedy**
  - **Suggested Remedy Text**: reference other clauses besides clause 72 on line 36 or change clause 72 to include other items besides 10GBASE-KR (and change it's title). Also do the equivalent for Clause 45.2.1.77 to 45.2.1.87

- **See comment #17 - 2 locations.**

- **Comment ID #465**
  - **Comment Type**: E  
  - **Comment Status**: A  
  - **Comment Text**: typo

- **Suggested Remedy**
  - **Suggested Remedy Text**: Change "based" to "base"

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

- **See comment #311**

- **Comment ID #466**
  - **Comment Type**: T  
  - **Comment Status**: A  
  - **Comment Text**: The wording in this paragraph implies that shorter cables are not compliant.

- **Suggested Remedy**
  - **Suggested Remedy Text**: Change "represents a physical medium of ....." to "represents the ability to operate over a physical medium of ....." 5 places.

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

- **Response Text**: Accept suggested remedy and also:
  - add 'up to'  
  - and change "least" to "least" on line 21.

- **For example change:**
  - The letter C in the port type (e.g. 40GBASE-CR4 or 100GBASE-CR10) represents a physical medium of shielded balanced copper cabling assembly of at least 10 m in length to:
  - The letter C in the port type (e.g. 40GBASE-CR4 or 100GBASE-CR10) represents the ability to operate over a physical medium of shielded balanced copper cabling assembly of up to at least 10 m in length.

- **Make similar change for the other port types.**

- **See response to comments # 36 and # 112**
The statement on line 1 implies that only the items in table 83-1 are supportable. However, the table is titled "example PMA variants". A 2 lane solution I believe is supportable at 100G and might be used in the future.

**Suggested Remedy**

Either include all the supportable PMA stages in table 83-1 or change the sentence on line 1 to "Table 83-1 summarizes some examples of the supportable PMA stages for each interface rate however it is not exhaustive."

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

Overtaken by events. Table will be removed. See comment 332.

---

It would be highly desirable to include the prbs9 function as suggested in the TBD note.

**Suggested Remedy**

Add the PRBS9 test pattern.

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

See comment #232 for the editor's note to be added.

---

I agree that 8ones followed by 8 zeros is a good choice.

**Suggested Remedy**

Implement the 8one 8 zero and remove the TBD's.

**Response**

**Response Status** C

ACCEPT.
### Task force Review

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<td>#472</td>
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<td>Dudek, Mike JDSU</td>
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<tr>
<td>85 SC 85.7.4 P 178 L 44</td>
<td>Cables are removable (not like backplanes). What will cause Signal Detect to become Fail if the link is broken.</td>
<td>REJECT.</td>
<td>Cables are removable (not like backplanes). What will cause Signal Detect to become Fail if the link is broken.</td>
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<tr>
<td>85 SC 85.11.1 P 191 L 42</td>
<td>Connectors can't meet the requirements of both style 1 and style 2.</td>
<td>ACCEPT.</td>
<td>Connectors can't meet the requirements of both style 1 and style 2.</td>
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</table>

**Comment Type:** T  **Comment Status:** R
**Suggested Remedy:**
- If a broken link will create system reset then an informative note to that effect would be good. If it won't then change the function to include a signal present detection in addition to successful completion of start up protocol.

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

Signal detect is implemented in 85.7.4; if the link is broken auto-negotiation restarts and training.

**Comment ID:** #473
**Comment Type:** T  **Comment Status:** A
**Comment:** Connectors can't meet the requirements of both style 1 and style 2.

**Suggested Remedy:**
- Change "(Style 1) and 85.11.1.2 (Style 2)" to "(Style 1) or 85.11.1.2 (Style 2)"

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

### Task force Review

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<td>86 SC 86.5 P 207 L 21</td>
<td>Although there are no requirements on the physical location of the various lanes within the group of lanes there is a requirement for knowing which fibers in the MTP are used for Tx, which are used for Rx and which are not used.</td>
<td>A</td>
<td>Although there are no requirements on the physical location of the various lanes within the group of lanes there is a requirement for knowing which fibers in the MTP are used for Tx, which are used for Rx and which are not used.</td>
</tr>
</tbody>
</table>

**Comment Type:** TR  **Comment Status:** A
**Suggested Remedy:**
- insert the word "electrical" so that the sentence becomes "..... where the electrical lanes are physically....."*

- insert two subsections.
  "86.5.1 Optical lane assignments for 40GBASE-SR4"
  Although the location of lanes within the group of Tx lanes is not required, it is necessary to define the positions of the Tx lanes and Rx lanes within the ribbon fiber connector. Figure xxx shows the location.

* 86.5.2 Optical lane assignments for 100GBASE-SR10
  Although the location of lanes within the group of Tx lanes is not required, it is necessary to define the positions of the Tx lanes and Rx lanes within the ribbon fiber connector. Figure yyy shows the location.*

**Comment Status:** A  **Response Status:** C
**Response:**
- Figure xxx to be as in INF-8438i figure 20 with the following changes. Title becomes 40GBASE-SR MDI optical receptacle and channel orientations. Replace the row saying Fiber number with "Fiber positions xxxxxxxxx (12 x's). Replace the numbers in the Transmit and recieve Channel rows with xxxx. Add an additional row with "Unused positions" and place XXXX in the middle 4 positions.

*  Figure yyy to say "TBD. Editors note to be removed prior to publication The figure will show the fibers at the edge of a 12 fiber ribbon as unused positions (ie fiber numbers 1 and 12 are unused.)."

**Response:** C
**Response Status:** ACCEPT IN PRINCIPLE.
In clause 86.5 Change "define where the lanes are physically" to "define where the electrical lanes are physically"

- insert two subsections.
  *.86.5.1 Optical lane assignments for 40GBASE-SR4"*
  *.86.5.2 Optical lane assignments for 100GBASE-SR10"*
  *Add editor's note to each subclause to say presentations to define the contents of this subclause are invited.*
It would be good to label Table 86-6 with "at TP1a" at the end of the title.

Suggested Remedy

ACCEPT.

Dudek, Mike JDSU

Comment ID # 476

In order to ensure that reflections don't overly degrade performance, the differential return loss of the host needs to be specified. To control EMI the common mode return loss of the host also needs to be specified.

Suggested Remedy

Add rows to Table 86-6 after AC common mode.

"Differential output reflection coefficient, SDD22 Max see 86.6.1.1
Differential Output common mode reflection coefficient, SCC22 Max -6dB 10MHz to 2.5GHz, -3dB 2.5GHz to 11.1GHz"

Change title and text of 86.6.1.1 to say "SDD11 at TP1 and SDD22 at TP1a" (ie 2 places)

Response

ACCEPT IN PRINCIPLE.

Dudek, Mike JDSU

Comment ID # 476

In order to ensure that reflections don't overly degrade performance, the differential return loss of the host needs to be specified. To control EMI the common mode return loss of the host also needs to be specified.

Suggested Remedy

Add rows to Table 86-6 after AC common mode.

"Differential output reflection coefficient, SDD22 Max see 86.6.1.1
Differential Output common mode reflection coefficient, SCC22 Max -6dB 10MHz to 2.5GHz, -3dB 2.5GHz to 11.1GHz"

Change title and text of 86.6.1.1 to say "SDD11 at TP1 and SDD22 at TP1a" (ie 2 places)

Response

ACCEPT IN PRINCIPLE.

Dudek, Mike JDSU

Comment ID # 476

In order to ensure that reflections don't overly degrade performance, the differential return loss of the host needs to be specified. To control EMI the common mode return loss of the host also needs to be specified.

Suggested Remedy

Add rows to Table 86-6 after AC common mode.

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Change title and text of 86.6.1.1 to say "SDD11 at TP1 and SDD22 at TP1a" (ie 2 places)

Response

ACCEPT IN PRINCIPLE.

Dudek, Mike JDSU

Comment ID # 476

In order to ensure that reflections don't overly degrade performance, the differential return loss of the host needs to be specified. To control EMI the common mode return loss of the host also needs to be specified.

Suggested Remedy

Add rows to Table 86-6 after AC common mode.

"Differential output reflection coefficient, SDD22 Max see 86.6.1.1
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Change title and text of 86.6.1.1 to say "SDD11 at TP1 and SDD22 at TP1a" (ie 2 places)

Response

ACCEPT IN PRINCIPLE.

Dudek, Mike JDSU

Comment ID # 476

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Suggested Remedy

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"Differential output reflection coefficient, SDD22 Max see 86.6.1.1
Differential Output common mode reflection coefficient, SCC22 Max -6dB 10MHz to 2.5GHz, -3dB 2.5GHz to 11.1GHz"

Change title and text of 86.6.1.1 to say "SDD11 at TP1 and SDD22 at TP1a" (ie 2 places)

Response

ACCEPT IN PRINCIPLE.

Dudek, Mike JDSU

Comment ID # 476

In order to ensure that reflections don't overly degrade performance, the differential return loss of the host needs to be specified. To control EMI the common mode return loss of the host also needs to be specified.

Suggested Remedy

Add rows to Table 86-6 after AC common mode.

"Differential output reflection coefficient, SDD22 Max see 86.6.1.1
Differential Output common mode reflection coefficient, SCC22 Max -6dB 10MHz to 2.5GHz, -3dB 2.5GHz to 11.1GHz"

Change title and text of 86.6.1.1 to say "SDD11 at TP1 and SDD22 at TP1a" (ie 2 places)

Response

ACCEPT IN PRINCIPLE.

Dudek, Mike JDSU

Comment ID # 476

In order to ensure that reflections don't overly degrade performance, the differential return loss of the host needs to be specified. To control EMI the common mode return loss of the host also needs to be specified.

Suggested Remedy

Add rows to Table 86-6 after AC common mode.

"Differential output reflection coefficient, SDD22 Max see 86.6.1.1
Differential Output common mode reflection coefficient, SCC22 Max -6dB 10MHz to 2.5GHz, -3dB 2.5GHz to 11.1GHz"

Change title and text of 86.6.1.1 to say "SDD11 at TP1 and SDD22 at TP1a" (ie 2 places)

Response

ACCEPT IN PRINCIPLE.
Optical receivers are in general limited by the peak power of the input signal (Average power is less important). As the spec stands the receiver has to cope with the maximum input average power at infinite extinction ratio with the allowed eye mask overshoot. This is much more than is likely to happen in practice. We should limit the peak power explicitly.

**SuggestedRemedy**
Add extra rows to Tables 86-8, 86-9, 86-10.

Peak Power Max 3dBm. (no min)

To this row in table 86-8 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 86.7.4.7

**Response**

ACCEPT IN PRINCIPLE.

Insert an editor's note that a possible peak power specification or a maximum OMA limit is under consideration for 40/100GBASE-SR

See also comment # 406.

---

In order to ensure that reflections don't overall degrade performance, the differential return loss of the host needs to be specified. To control EMI the differential to common mode reflection coefficient of the host also needs to be specified.

**SuggestedRemedy**
Add rows to Table 86-12 after Deterministic jitter tolerance

"Differential input reflection coefficient, SDD11 Max see 86.6.5.1
Reflected Differential to common mode conversion, SCD11 Max -10dB 10MHz - 11.1GHz

Change title and text of 86.6.5.1 to say "SDD22 at TP4 and SDD11 at TP4a" (ie 2 places)

**Response**

ACCEPT.

---

For consistency and to ensure reproducible measurements the square test pattern with a fixed number of ones and zeros should be used for the measurements of OMA, and RIN.

The budgeting for the link assumes that the difference between the OMA for the Tx and the OMA for the Rx is the optical loss (average power). If the prbs9 is used to measure OMA for the Tx while square wave is used for the Rx this may no longer be true as the prbs9 pattern and square wave pattern will not always give the same answer. (If a vendor wishes to use prbs9 for production test the vendor should guard band his measurements for the differences the guard band being based on his own product characteristics.)

**SuggestedRemedy**
Make the measurements of OMA and RIN patterns Square eight ones and eight zeros for all three rows in standard font. Remove the editor preference note. Change the footnote to say "The items in italics" instead of "The second column"

**Response**

ACCEPT.
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<th>P 215</th>
<th>L 3</th>
<th>#</th>
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<th>JDSU</th>
<th>Comment</th>
<th>Suggested Remedy</th>
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<td>Missing definition of AC common mode voltage</td>
<td>Copy the section from SFF8431 D.15 with editorial changes to remove SFP+ references.</td>
<td>ACCEPT IN PRINCIPLE.</td>
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<td>See resolution of comment 350</td>
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<td>It is bad practice to specify things in two places.</td>
<td>Copy the section from SFF8431 D.16</td>
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<td>We need to say what test pattern is on the channels not under test</td>
<td>Add the sentence. <em>The pattern on the lanes not under test should be prbs31 or valid 40GBASE-R encoded data.</em></td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
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</table>

**Cl 86 SC 86.7.4.6 P 215 L 45 # 485**

Dudek, Mike

**Comment:**
We need to say what test pattern is on the channels not under test.

**Suggested Remedy:**
Add the sentence. *The pattern on the lanes not under test should be prbs31 or valid 40GBASE-R encoded data.*

**Response:**
ACCEPT IN PRINCIPLE.

Add the sentence: "The signal on the lanes not under test should be Pattern 3 (PRBS31) or a valid 40GBASE-R or 100GBASE-R signal.*"
I understand that the chromatic specifications for OM3 fiber are now tighter than listed here.

SuggestedRemedy
Change the max value of the zero dispersion wavelength from 1320nm to 1316nm.
Change the Chromatic dispersion slope line max to 0.1028 for 1300<=lambda <= 1316 and ......

Response
ACCEPT IN PRINCIPLE.

Response Status C

Replace the zero dispersion wavelength value with:
1295 <= lambda0 <= 1340

Replace the dispersion slope value with:
<= 0.105 for 1295 nm <= lambda0 <= 1310
<= 0.000375(1590 - lambda0) for 1310 nm <= lambda0 <= 1340 nm

See also comment # 520

Comment Type TR

Comment Status A Fibre specs

I understand that the chromatic specifications for OM3 fiber are now tighter than listed here.

SuggestedRemedy
Change the max value of the zero dispersion wavelength from 1320nm to 1316nm.
Change the Chromatic dispersion slope max line to 0.1028 for 1300<=lambda <= 1316 and ......

Response
ACCEPT IN PRINCIPLE.

Response Status C

Replace the zero dispersion wavelength value with:
1295 <= lambda0 <= 1340

Replace the dispersion slope value with:
<= 0.105 for 1295 nm <= lambda0 <= 1310
<= 0.000375(1590 - lambda0) for 1310 nm <= lambda0 <= 1340 nm

See also comment # 520

Comment Type T

Comment Status A Optical Reflections

With a specification for the receiver reflection of -26dB there is no need to require the Transmitter to tolerate a 12dB reflection. The cable is limited to 26dB return loss at any discrete reflection. A tolerance to 20dB reflection would appear adequate.

SuggestedRemedy
Change optical return loss tolerance from 12dB to 20dB on line 30. Change RIN12 to RIN20 on line 28. Change RIN12 to RIN20 in 87.7.7 page 236 line 20 and insert "that the reflection is 20dB and" between "exception" and "that" on page 236 line 21, change 12db to 20dB for optical return loss in table 87-11 on page 235 line 17, and change from TBD to 21 for the optical return loss in table 87-13 page 239 line 17.

Response
ACCEPT IN PRINCIPLE.

Response Status C

In addition to the changes proposed in this comment, in Table 87-13 change "Optical return loss" to "Optical return loss (min)"
It is bad practice to specify things in two places.

Suggested Remedy
Change "using a valid 40GBASE-R signal" with "using the test pattern defined in table 87-10."

Resolution as comment 383
See also comments 499, 507, 510

There are multiple different jitter measurements.

Suggested Remedy
Change "Jitter less than 0.2UI" to "Total Jitter less than 0.2UI".

Resolution as comment 383
Add footnote d to the Rise/fall time row. Footnote d to say "Rise and Fall times are defined in 83A.4.4"

Type Transition time appears to be the same as rise/fall time. If they are the same they should be called the same thing here and in table 83A-1, and 83A.4.4

Suggested Remedy
Change "Transition time" to "Rise/fall time" in the title of this subclause and in the first sentence.

Resolution as comment 383
Add footnote d to the Rise/fall time row. Footnote d to say "Rise and Fall times are defined in 83A.4.4"

There is still a lot of energy at frequencies below 50MHz. Having an unconstrained return loss at one end of the trace and only 12dB return loss at the other end can lead to large signal distortion.

Suggested Remedy
Change 50MHz to 10 MHz here and in equation 83A-3 (page 288 line 4)

Resolution as comment 383
Add footnote d to the Rise/fall time row. Footnote d to say "Rise and Fall times are defined in 83A.4.4"

Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID
Comment Type: TR  Comment Status: A
This section is describing SCD11 which is not common mode input return loss

Suggested Remedy:
Change the title of the section to "Reflected differential to common mode conversion.

Response:

Response Status: C
ACCEPT IN PRINCIPLE.

Change the title of the section to "differential to common mode conversion"

---

Comment Type: T  Comment Status: A
An eye mask that does not state at what probability it is to be met has led to confusion in the past.

Suggested Remedy:
Add to the editors note here "This section should include at what probability the eye mask has to be met"
or state the probabilities in Sections 83A.4.2 and 83A.3.3.5

Response:

Response Status: C
ACCEPT IN PRINCIPLE.

Add to the editors note here "This section should include at what BER the eye mask has to be met"

---

Comment Type: T  Comment Status: A
It is bad practice to specify things in two places.

Suggested Remedy:
Change "using TBD test pattern or a valid 40GBASE-R signal" with "using the test pattern defined in Table 87-10."

Response:

Response Status: C
ACCEPT IN PRINCIPLE.

Change "measured using TBD test pattern or a valid 40GBASE-R signal" to "measured using the test pattern defined in Table 87-10"
Change the relevant TBD in Table 87-10 to "TBD or valid 40GBASE-R signal"
See also comments 383, 484, 490, 507 and 510
**Comment Type** T  **Comment Status** A  **Channel**

The channel characteristics for max channel insertion loss, and Positive and negative dispersion are a function of wavelength it would be good to note the wavelength range for which the values in table 87-13 apply.

**SuggestedRemedy**

Add a footnote to Channel insertion loss (max), Positive dispersion (max), and negative dispersion (min). The footnote to say: Over the wavelength range 1264.5nm to 1337.5nm.

**Response**

ACCEPT IN PRINCIPLE.

Add the footnote as per the suggested remedy and remove editor's note below table 87-13.

---

**Comment Type** T  **Comment Status** A  **P247**

It would be helpful to the reader to explicitly point out that there are no electrical specs for the 25G PMD service interface in this document. (See also Anslow_05_1108.pdf)

**SuggestedRemedy**

Change the first part of the note on figure 88-2 to "Specification of the retimer function and the electrical implementation of the PMD service interface is beyond the scope of this standard".

**Response**

ACCEPT.

This is done in the proposed diagram on slide 5 of ansslow_05_1108.pdf

---

**Comment Type** T  **Comment Status** R  **P248**

The Signal Detect does not need to be guaranteed to be OK when the input signal is less than a valid link will supply. This level is the stressed sensitivity not the sensitivity.

**SuggestedRemedy**

Insert the word "stressed" in front of receiver on line 44 in table 88-4.

**Response**

REJECT.

This comment was WITHDRAWN by the commenter.

---

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID
Optical receivers are in general limited by the peak power of the input signal (Average power or OMA is less important). As the spec stands the receiver has to cope with the maximum input average power with the maximum OMA and the allowed eye mask overshoot. This is much more than is likely to happen in practice and is also restricting the maximum OMA at lower average powers. We should limit the peak power explicitly, and relax the maximum OMA value. (The suggested value equates to a maximum OMA of 4.5dBm with a maximum Average power of 4.5dBm, or an ER of 4.7 at 4.5dBm average power).

**Suggested Remedy**

Add an additional row in tables 88-7,88-8, with

- Peak Power Max 6.3dBm. (no min)
- Increase the Maximum OMA to 5.5dBm.

To the peak power row in table 87-7 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 88.8.8

**Response**

ACCEPT IN PRINCIPLE.

Insert an editor's note that a possible peak power specification is under consideration for 100GBASE-LR4 and ER4.

---

It is bad practice to specify things in two places.

**Suggested Remedy**

Change "using a valid 40GBASE-R signal" with "using the test pattern defined in table 88-14."

**Response**

ACCEPT IN PRINCIPLE.

Change "modulated using a valid 100GBASE-R signal." to "modulated using the test pattern defined in Table 88-14."

See also comments #383, #484, #490, #499 and #510
Comment: There are multiple different jitter measurements.

Suggested Remedy:
- Change "Jitter less than 0.2UI" to "Total Jitter less than 0.2UI".

Response: ACCEPT IN PRINCIPLE.
- "Jitter less than 0.20 UI peak-peak" to "Total jitter less than 0.20 UI peak-peak".

See also comment #491.

Comment: spelling error

Suggested Remedy:
- Change "sereate" to separate.

Response: ACCEPT.

[Clause number changed from 87 to 88]

Comment: It is bad practice to specify things in two places.

Suggested Remedy:
- Change "using aTBD test pattern or a valid 40GBASE-R signal" with "using the test pattern defined in Table 88-14."

Response: ACCEPT IN PRINCIPLE.
- "measured using TBD test pattern or a valid 100GBASE-R signal." to "measured using the test pattern defined in Table 88-14."
- Change the relevant TBD in Table 88-14 to "TBD or valid 100GBASE-R signal."

See also comments #383, #484, #490, #499 and #507.

Comment: Spurious precision in the Baud period. The tolerance of the signaling rate is +/-100ppm and is only listed to 6 significant digits

Suggested Remedy:
- Round the Baud period to 6 significant figures here and in tables 83A-1 and 83A-2

Response: ACCEPT IN PRINCIPLE.

See remedy in 362.
Comment Type: T  Comment Status: A
In Table 83A-1 it would be good to reference the rise/fall test methodology as with a Tx with pre-emphasis the value depends greatly on the exact methodology.

Suggested Remedy
Add footnote d to the Rise/fall time row. Footnote d to say “Rise and Fall times are defined in 83A.4.4

Response  Response Status: C
ACCEPT IN PRINCIPLE.

Add foot note which says “Rise/Fall time measurement methodology defined in 83A.4.4

Comment Type: TR  Comment Status: A
The MPO connector is the form of choice on cabling infrastructure supporting array connectivity. It is also the connector selected in MSAs like the QSFP and SNAP12. Unlike past standardization periods where two-fiber connector forms were hotly debated, the MPO is virtually uncontested in the array connectivity space. This permits straight forward specification of the MPO to terminate the cabling at the MDI. Note that the proposed interface type 7-4 permits from 2 to 24 fibers. It is expected that this may be further defined to be fiber-count specific. This specificity is already possible in the cans of 40GBASE-SR4 as the 12 fiber type. It may be either 12 or 24 fibers as the MSA for 100GBASE-SR10 is defined.

Suggested Remedy
Add the following:
The connector type terminating the cabling at the MDI shall meet the specifications of IEC 61754-7 interface 7-4 (MPO female plug connector with flat interface).

Response  Response Status: C
ACCEPT IN PRINCIPLE.

Add an editor's note to say that the MPO connector is an example of a suitable connector for the MDI

Comment Type: T  Comment Status: A
The maximum skew and dynamic skew for the multimode fiber medium are TBDs that require values. The values suggested are calculated using the skew model adopted by the TF in May 2008 found in kolesar_02_0508.xls with the default worst-case parameters at a link length of 300 m to allow for the possibility of extended reach technologies. Engineering the de-skew circuits to handle this amount of skew will permit support for possible future enhancements. Note that the skew value suggested here three times larger than that suggested in another comment submitted against line 46 of page 218 (table 86-17) wherein the channel distance is explicitly defined as a 100 m maximum.

Suggested Remedy
Replace the existing sentence with:
The delays through the medium shall match to within 13.6 ns and do not change by more than 20.3 ns including the effects of varying launch conditions and operating wavelength.

Response  Response Status: C
ACCEPT IN PRINCIPLE.

Same resolution as comment # 345

Comment Type: T  Comment Status: A
Cabling skew value is presently TBD and needs to be defined.

Suggested Remedy
Replace TBD with 4.5. This value is consistent with the worst-case value for a 100 m link as determined using the MM skew model kolesar_02_0508.xls.

Response  Response Status: C
ACCEPT IN PRINCIPLE.

See resolution of comment # 308

See comments # 355.
The insertion loss measurement referenced in under revision and has passed CVD ballot and is entering FDIS stage. The methods have been renamed. Method 2 is becoming the method of Annex A.

Suggested Remedy
Replace "Method 2" with "Annex A".

Response
ACCEPT IN PRINCIPLE.
Add this information as an editor's note and adopt it when the new IEC 61280-4-1 is published.

The present specification references a fiber specification as if it were a cabling specification. This can be remedied by referencing the cabling specifications for ribbon and multitube cable forms, and also stating that the fiber contained within these cable shall meet the OM3 fiber performance code. The presently referenced cable specs are inappropriate, as the first is for simplex and duplex indoor cable, and the second for premises outdoor cable.

Suggested Remedy
Replace:
The 40GBASE-SR4 and 100GBASE-SR10 fiber optic cabling shall meet the requirements of IEC 60793-2-10 and the requirements given in Table 86-18, where they differ. Multimode cables chosen from [Editor's note (to be removed prior to publication) - Insert additional reference for multiway cable if appropriate], IEC 60794-2-11 or IEC 60794-3-12 may be suitable.

With:
The 40GBASE-SR4 and 100GBASE-SR10 fiber optic cabling shall meet the requirements of IEC 60794-2-21 or IEC 60794-2-31. The fiber contained within these cables shall meet the requirements of IEC 60793-2-10 type A1a.2.

Response
ACCEPT IN PRINCIPLE.

40GBASE-SR4 and 100GBASE-SR10 can operate over duplex cables (using several pairs); special ribbon cable is not required.

Change first two sentences of 86.10.2.1 to:
The fiber contained within the 40GBASE-SR4 and 100GBASE-SR10 fiber optic cabling shall meet the requirements of IEC 60793-2-10 type A1a.2 and the requirements given in Table 86-18, where they differ. A variety of multimode cable types may fulfill these requirements, provided the resulting channel also meets the cabling skew requirement in Table 86-17.
The dispersion characteristics quoted have been superseded. The third edition of IEC 60793-2-10 published in 2006 adjusted the characteristics to more closely reflect the actual dispersion characteristics of 50μm fibers. Requiring the fiber to meet IEC 60793-2-10 makes repeating the dispersion characteristic in table 86-18 redundant. But if these specs must be repeated, then they should be in harmony with the IEC spec.

Suggested Remedy

- Replace the zero dispersion wavelength value with: $1295 < \lambda_0 < 1340$
- Replace the dispersion slope value with:
  - $< 0.105$ for $1295 \text{ nm} < \lambda_0 < 1310$
  - $0.000375(1590 - \lambda_0)$ for $1310 \text{ nm} < \lambda_0 < 1340 \text{ nm}$

Note: All the above < symbols should be "less than or equal to" symbols.

Response

ACCEPT IN PRINCIPLE.

See response to comment # 486
The "I" in the "MDI" label is the wrong font size :).  

SuggestedRemedy

Make it bigger...  

ACCEPT.

[added 69 to subclause number in comment]

Punctuation missing for "In case of successful decoding the decoder..."

SuggestedRemedy

"In case of successful decoding, the decoder..."  
or possibly  
"In the case of successful decoding, the decoder..."

ACCEPT.  

[corrected subclause number in comment]

This is text from the base standard so should not be modified unless there is a serious problem with it.

"When it is necessary to designate the control character for the sequence ordered_set specifically, /Q/ will be used."

SuggestedRemedy

Clarify what is meant by needing to specify the control character.

ACCEPT IN PRINCIPLE.

[Changed subclause number 2.4.10 to 82.2.4.10]

There have been several comments on the ordered set description. This will be clarified by combining the text from 82.2.4.5 and 82.2.4.10.

A design that allows for a large amount of skew tolerance does not add any additional latency. Latency due to skew only occurs due to the differential delay between all paths between the source and destination. The path with the largest latency will end up with the smallest skew buffer.

SuggestedRemedy

Add something like:  

A note was added.
Comment ID # 527

Cl  82  SC  82.2.17.2.2  P 131  L 18  # 527
Ofelt, David  Juniper Networks

Comment Type  E  Comment Status  A

bit number is wrong- rx_raw is 72 bits wide, but the description does not number the bits properly.

Suggested Remedy

OLD:
Vector containing one MII transfers. RXC<0> through RXC<7> are from rx_raw<0> through rx_raw<7>, respectively. RXD<0> through RXD<63> are from rx_raw<8> through rx_raw<63>, respectively.

NEW:
Vector containing one MII transfers. RXC<0> through RXC<7> are from rx_raw<0> through rx_raw<7>, respectively. RXD<0> through RXD<63> are from rx_raw<8> through rx_raw<71>, respectively.

Response  Response Status  C
ACCEPT.

[Changed subclause number 2.17.2.2 to 82.2.17.2.2]

Comment ID # 528

Cl  83  SC  83.3  P 149  L 10  # 529
Ofelt, David  Juniper Networks

Comment Type  E  Comment Status  A

I find the usage of m, n, p, q, and x, y to be inconsistent throughout the text.
p and q seem to always be the the number of links on the RS/FEC facing and PMD sides of a given PMA.
x and y are introduced here "A Tx PMA with x input lanes and y output lanes is paired with an Rx PMA with y input lanes and x output lanes" but then in 83.3.1 and 83.3.2, x is always used as the input lane count and y as the output lane count - this is direction independent.

Then in figure 83-4 and in the text that deals with bits assigned to virtual lanes (e.g. 83.6.2), m and n are used for the input and output lane count and "x" is used for the offset of the current bit.

Suggested Remedy

Make the variable usage more consistent. One way would be to have the generic input and output lane counts be "m" and "n" and the direction-specific counts as "p" and "q". x and y can then be reserved for talking about bit positions or any other need for a generic variable.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Overtaken by events. Update per trowbridge_02_1108 gives fewer opportunities to use different lane count variables.

Comment ID # 529

Cl  83  SC  83.2  P 148  L 4  # 529
Ofelt, David  Juniper Networks

Comment Type  E  Comment Status  A

Figure 83-4

Every variable in the figure is defined except for "v".

Suggested Remedy

Add a label to define "v" to the figure.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

[Changed subclause 2 to 83.2]

v is changed to z now that virtual lanes are PCS lanes
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<tbody>
<tr>
<td>530</td>
<td>T</td>
<td>A</td>
<td>Ofelt, David</td>
<td>C</td>
<td>Figure 82-13 - The state diagram is confusing (at least to me) about whether it is intending to declare alignment lock after 2 or 4 alignment blocks. The state diagram has a back arc from VALID_AM to TEST_AM if am_cnt &lt; 4, but if am_cnt is two, then it exits to the 2_GOOD state and we declare that we have alignment lock for that lane. There does not seem to be any text description of the process, so I can't double-check the intent that way. Suggested Remedy If the state diagram is in error (should be am_cnt==4 to get lock), then fix it. Otherwise, add some descriptive text to 82.2.12 to describe the general algorithm. Actually, adding descriptive text in either case would be good. Response ACCEPT. Comment #41 also addressed part of this. The intent is to create lock after two markers. Descriptive text will be added.</td>
</tr>
<tr>
<td>531</td>
<td>T</td>
<td>A</td>
<td>Ofelt, David</td>
<td>C</td>
<td>Response to the Editor's question about should the BIST logic report errors per lane... Suggested Remedy I think that we either need to provide a error counter per lane or there needs to be registers that capture the lane number of the first lane to see errors and then the error count for that lane. Response ACCEPT IN PRINCIPLE.</td>
</tr>
<tr>
<td>532</td>
<td>T</td>
<td>A</td>
<td>Vijayaraghavan, Divya</td>
<td>C</td>
<td>Block Types 4b and 55 have the same format in the 64b/66b table (figure 82-5). Typo in block type 55. Suggested Remedy Remove block type 55. Does not apply to 8 byte alignment. Response ACCEPT IN PRINCIPLE. See comment 247.</td>
</tr>
<tr>
<td>533</td>
<td>E</td>
<td>A</td>
<td>Vijayaraghavan, Divya</td>
<td>C</td>
<td>Page: 58, 63 - Table 45 -97a: register value should be 3.51 not 3.50 - Table 45 -99a: register value should be 3.53 not 3.50 Suggested Remedy Always compare to 2 or 4, but not both. Response ACCEPT IN PRINCIPLE. The editor does not understand the proposed remedy. Change Table 45-97a, register number from 3.50 to 3.51 Change Table 45-99a, register number from 3.50 to 3.53</td>
</tr>
</tbody>
</table>
Cl 82 SC 82.2.17.3 P 137 L 27 # 534
Vijayaraghavan, Divya Altera Corp.

Comment Type T Comment Status R amsm
Inconsistency in am_cnt in alignment marker state machine
SuggestedRemedy
Always compare to 2 or 4, but not both.
Response Response Status C REJECT.

[Changed subclause number from Figure 82-13 to 82.2.17.3]

It compares to 2 for going in lock, 4 for out of lock, this is the baseline.

Cl 82 SC 82.2.9 P 127 L 5 # 535
Vijayaraghavan, Divya Altera Corp.

Comment Type TR Comment Status A
Lane 10: 2d and de are not inversions of each other. Which is right and which needs correction?
SuggestedRemedy
Fix incorrect value
Response Response Status C ACCEPT.

In Lane 10, change 0x2d to 0x21

Cl 85 SC 85.11 P 192 L # 536
Fogg, Michael Tyco Electronics

Comment Type T Comment Status A
Figures 85-10 and 85-11
Add Figure
SuggestedRemedy
Figures to be provided on supporting documents
Response Response Status C ACCEPT IN PRINCIPLE.

Supporting documentation to be reviewed by sub-task force.

Figure 85-10 and 85-11 shall be Style-1 40GBASE-CR4 MDI connectors plug and receptacle referenced in small form factor pluggable (QSFP), SFF-8436.

Cl 85 SC 85.7 P 193 L # 537
Fogg, Michael Tyco Electronics

Comment Type T Comment Status A
Table 85-7
Add values
SuggestedRemedy
Add values from QSFP Specification, to be provided in supporting documentation
Response Response Status C ACCEPT IN PRINCIPLE.

Supporting documentation to be reviewed by sub-task force.
Table 85-7-Style-1 40GBASE-CR4 lane to MDI connector pin mapping shall be plug and receptacle referenced in small form factor pluggable (QSFP), SFF-8436.
<table>
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<th>Cl 85</th>
<th>SC 85.7</th>
<th>P 177</th>
<th>L</th>
<th># 538</th>
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<tr>
<td>Figure 85-2</td>
<td>Location of TP-1 and TP-4</td>
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<td>Recommend either placing two new test points TP-0 and TP-5 located 4” from connector (per nicholl_01_0708.pdf) or to move TP-1 and TP-4 a specified amount of loss (possibly 2dB @ 5.1625GHz)</td>
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<td><strong>SuggestedRemedy in comment#451</strong></td>
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<th>P 184</th>
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<td><strong>SuggestedRemedy</strong></td>
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<tr>
<td>Figure 85-6</td>
<td>Replace TBD values with actual limit numbers, and remove ELFEXT and MDELFEXT as they are redundant</td>
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<tr>
<td>Suggested remedy comment #453 and comment #454</td>
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<td><strong>SuggestedRemedy</strong></td>
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<tr>
<td>Figure 85-4 - Provide specific values for cable assembly (TP-1 to TP-4), and for cable assembly including fixturing (TP-0 to TP-5)</td>
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<td>All cable assembly measurements are to be made between TP1 and TP4 as illustrated in Figure 85-2. Two mated connector pairs have been included in the cable assembly specifications defined in 85.9.</td>
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<td>We intend to close on the test point measurements regarding de-embedding utilizing editor's note.</td>
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<tr>
<td>Add specific values for cable assembly and cable assembly with fixturing for return loss</td>
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<tr>
<td>#542</td>
<td></td>
<td>T</td>
<td>A</td>
<td>Replace TBD values for NEXT with specific values</td>
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<tr>
<td>#543</td>
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<td>T</td>
<td>A</td>
<td>Replace TBD values on MDNEXT with specific values</td>
<td>Values to be provided from supporting documents</td>
<td>ACCEPT IN PRINCIPLE.</td>
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<tr>
<td>#544</td>
<td></td>
<td>T</td>
<td>A</td>
<td>Figure 85-6 Remove or add specific values</td>
<td>Add values from supporting documents</td>
<td>ACCEPT IN PRINCIPLE.</td>
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<td>#545</td>
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</table>
Cl 85 SC 85.7 P 189 L  #546
Fogg, Michael Tyco Electronics

Comment Type T  Comment Status A
Remove MDELFEXT - Use ICR specification
Remove Figure 85-7
Remove Figure 85-8

Suggested Remedy

Response  Response Status C
ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.7 to subclause field]

Suggested Remedy in comment #454

Cl 85 SC 85.10 P 191 L  #547
Fogg, Michael Tyco Electronics

Comment Type T  Comment Status A
Replace Trace Loss (TBD from Nicholl_01_0708.pdf) with specific values

Suggested Remedy
Provide values to discuss with Diminico Subgroup

Response  Response Status C
ACCEPT IN PRINCIPLE.

[Editor's note: Corrected missing subclause number 85.10 to subclause field]

Remedy provided in comment #448

Cl 85 SC 85.11.2 P 195 L  #548
Fogg, Michael Tyco Electronics

Comment Type T  Comment Status R
Add Figures 85-14 and 85-15

Suggested Remedy
Add mating face views from the SFF-8632 (referenced by 8092)
Figure 6.2 (Plug) and 6.3 (Receptacle)

Response  Response Status C
REJECT.

[Editor's note: Corrected missing Clause number and subclause numbers to clause/subclause number fields]

IBTA has selected the CXP connector (SFF-8642). Per (diminico_02_0708.pdf) the intent is to reference IBTA selected connector.

Cl 85 SC 85.11 P 196 L  #549
Fogg, Michael Tyco Electronics

Comment Type T  Comment Status R
Add lane to MDI connector pin mapping

Suggested Remedy
Table to be provided in supporting documentation

Response  Response Status C
REJECT.

[Editor's note: corrected missing subclause number 85.11 to subclause field]

More details on comment and suggested remedy required.
Supporting documentation to be reviewed by sub-task force.
### Comment ID # 550
**Comment Type:** E  
**Comment Status:** A  
**Suggested Remedy:**  
No space between is and in  
Add space  
**Response:**  
ACCEPT.

[Changed subclause 2 to 83.2]  
Also see comments #135, #414, and #201

### Comment ID # 551
**Comment Type:** TR  
**Comment Status:** R  
**Suggested Remedy:**  
MDIO base on 1.5 V HSTL logic in CL 45 is outdated and often require extra power source.  
Suggest to use JESD8-14A-01 duplicate table 45-65 MDIO electrical interface characteristics for 40/100 GbE  
Vdd - Supply Voltage 0.9 to 1.1 V  
Vih - Input high voltage 0.65*Vdd to Vdd+0.2  
Vil - Input low voltage -0.2 to 0.35*Vdd  
Voh - Output high voltage at Ioh=-2 mA, 0.75*Vdd (min)  
Vol - Output low voltage at Iol=2 mA, 0.25*Vdd (max)  
Ci - Input capacitance - 10 pf  
CL - Bus loading - 470 pf  
**Response:**  
REJECT.  
[Editor’s note: Removed text “all” from subclause field]  
There is no demonstrated demand to make such a substantial change. If the TF decides that it wishes to expand its scope to include such a change then text will be developed to define the new signaling in a manner that includes backward compatibility.

### Comment ID # 552
**Comment Type:** TR  
**Comment Status:** R  
**Suggested Remedy:**  
Learning KR specifications weakness the current interference tolerance test is not comprehensive since there is no group delay or phase info in the channel  
For 40GBase-KR4 replace magnitude response of Fig 69B.2 with pulse response of the channel  
**Response:**  
REJECT.  
group delay info is not necessary for short channels one meter in length  
also see comment 553  
[added 84 to subclause number in comment]

### Comment ID # 553
**Comment Type:** TR  
**Comment Status:** R  
**Suggested Remedy:**  
Informative channel in 69B has no phase or group delay, this is major weakness when KR specifications are proposed to be used for CR4 and CR10  
Please fix the problem as KR is not the gold standard, either provide group delay info for Fig 69B.2 or better provide pulse response for the channel  
**Response:**  
REJECT.  
see responses to comment 552 and 571  
[added 84 to subclause number in comment]
There is no definition of TP1 or TP4, please provide definition for TP1 and TP4

**Suggested Remedy**

TP1 definition - Any interconnect may be used between the SR4 or SR10 transmit function and TP1 as long as transmitter parameters of Table 85-4 are met.

TP4 definition - The interconnect from TP4 to SR4 or SR10 receive function shall be SDD21(dB) >= (-0.007 - 0.1684*SQR(f)) - 0.0617*f) f is given in GHz. SDD21 loss a Nyquist is 0.7 dB and 0.2 larger than SFP+ loss.

Response **Response Status** C

ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.7.1 to subclause field]

[Editors note: transmitter and receiver testing and definitions]

---

Transmitt and receive function are missing from Fig 83A

**Suggested Remedy**

Please add transmit and receive function to Fig 83A

Response **Response Status** C

ACCEPT IN PRINCIPLE.

---

Add 83A.2.1-Transmitters Compliance Points for the transmitter - Any interconnect which has a loss less than (SDD21(dB) (TBD)) f is given in GHz) between the XLAUI/CAUI transmit pin and Transmit Compliance Point may be used as long as transmitter parameters of Table 83A-1 are met.

Add 83A.2.2- Receivers Compliance Points for the receivers - Any interconnect which has a loss less than (SDD21(dB) (TBD)) f is given in GHz) between the XLAUI/CAUI receive pin and Receive Compliance Point may be used as long as receiver parameters of Table 83A-2 are met.
Cable return loss is missing, please add cable return loss

Purpose to use SDD22 as defined by EQ 83A-1 and SCC22 as defined by EQ 83A-2

---

The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.

Replace RJ with UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method
Replace DJ with DDJ per method of FC-PI-4 A.1.3.1 with PSBS 9 pattern

---

Duty Cycle distortion is classified to be 0.035 UI and is part of deterministic jitter, except the current definition of DCD does not capture pattern dependent component of DCD.

Propose to replace DCD with PWS (Pulse Width Shrinkage) with 0.1 UI value.
PWS is measured per FC-PI-4 Annex A.1.3.2 using PRBS9 pattern

---

PWS (Pulse Width Shrinkage) a critical parameter is missing from table 86-6 list of parameters.

Propose to add PWS (Pulse Width Shrinkage) with 0.1 UI value.
PWS is measured per FC-PI-4 Annex A.1.3.2 using PRBS9 pattern

---

Add editors note per 83A regarding jitter.

See editors note for SCC22.
**Comment ID # 561**

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

- **NEXT** has large high frequency component but the NEXT frequency is limited to 6 GHz.

**Suggested Remedy:**
- Increase NEXT frequency range to 11 GHz or show there is no impact limiting NEXT to 6 GHz.

**Response:** REJECT.

This comment was WITHDRAWN by the commenter.

[Editor's note: corrected missing subclause number 85.9.4.2 to subclause field]

Recommend supporting presentation that shows impact requiring increase of NEXT frequency range to 11 GHz.

**Comment ID # 562**

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

- **Pioneer (Pulse Width Shrinkage)** is a critical parameter on transmitter high frequency performance is missing from list of parameters in table 83A-1.

**Suggested Remedy:**
- Purpose to add Pioneer (Pulse Width Shrinkage) with 0.12 UI value.
- Pioneer is measured per FC-PI-4 Annex A.1.3.2 using PRBS9 pattern.

**Response:** ACCEPT IN PRINCIPLE.

[Editor's note: proposals for jitter methodology to be submitted against D1.1 for completion of TBDs]

**Comment ID # 563**

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

- With faster processes 24 ps transition time starting to be an issue.

**Suggested Remedy:**
- Suggest to change 24 ps to 20 ps.

**Response:** REJECT.

This comment was WITHDRAWN by the commenter.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Recommend submitting supporting presentation for sub-task force review.

**Comment ID # 564**

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

- To guarantee interoperability a transmitter compliance test method is required.

**Suggested Remedy:**
- Purpose to use software method of IEEE 802.3 CL 68 TWDP which uses cable impulse response.

**Response:** REJECT.

This comment was WITHDRAWN by the commenter.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Transmitter characteristics are tested at TP2. Subclause 85.8.3.1 specifies test fixtures, or functional equivalence, to measure the transmitter specifications described in 85.8.3. Contributions to improve 85.8.3.1 welcome.
Comment Type TR  Comment Status A

The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.

Suggested Remedy

Replace RJ with UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method
Replace DJ with DDJ of 0.15 UI per method of FC-PI4 A.1.3.1 with PSBS 9 pattern

Response Response Status C

ACCEPT IN PRINCIPLE.

See response in comment 476

Comment ID # 565

---

Comment Type TR  Comment Status A

The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.

Suggested Remedy

To limit the uncorrelated jitter add UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method
Replace DJ with DDJ of 0.17 UI per method of FC-PI4 A.1.3.1 with PSBS 9 pattern

Response Response Status C

ACCEPT IN PRINCIPLE.

Remedy provided in #562.

Comment ID # 566

---

Comment Type TR  Comment Status R

With faster processes 24 ps transition time starting to be an issue

Suggested Remedy

Suggest to change 24 ps to 20 ps

Response Response Status C

REJECT.

Presentation material was requested to support comment. SI concerns were raised regarding faster rise time.

Comment ID # 567

---

Comment Type TR  Comment Status A

Currently table 85-4 only has transmitter off level which is 30 mV and you wouldn't go that far with it!

Suggested Remedy

Please add VMA per definition of IEEE CL 68.6.2 with min value of 360 mV

Response Response Status C

ACCEPT IN PRINCIPLE.

Add editors note as before to consider with transmitter compliance testing.

Comment ID # 568

---

Comment Type TR  Comment Status R

Differential Output return loss is TBD

Suggested Remedy

Purpose to use SDD11 per equation 83A-1

Response Response Status C

REJECT.

This comment was WITHDRAWN by the commenter.

Comment ID # 569

---

[Editor's note: Added missing subclause number 85.7.1 to subclause field]

The draft reflects the consensus to utilize 10GBASE-KR (Clause 72) for 4x and 10x KR transmit and receive functions.

The TBD is applied to either utilize the Differential output return loss (min.) in 72.7.1.5 [See Equation (72-4) and Equation (72-5)] (TBD) or if deemed insufficient create new requirement in 85.9.x

Comment ID # 570

---

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]
Comment Type: TR  Comment Status: R
Common mode Output return loss is TBD

Suggested Remedy
Purpose to use SCC11 per equation 83A-2

Response  Response Status: C
REJECT.

This comment was WITHDRAWN by the commenter.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

The draft reflects the consensus to utilize 10GBASE-KR (Clause 72) for 4x and 10x KR transmit and receive functions.

The TBD is applied to either utilize the Common-mode voltage limits 72.7.1.4 or if deemed insufficient create new requirement in 85.9.x.

Comment Type: TR  Comment Status: A
Group delay information are necessary to guarantee cable interoperability

Suggested Remedy
Either add cable group delay or the cable pulse response

Response  Response Status: A
ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

Add editor's note in 85.9.x: [Editor's note (to be removed prior to publication) - subclause to specify group delay or other means to characterize post cursor response (TBD)]
IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

R573

Cl 85  SC 85.8.4  P 183  L 17  #
Ghiasi, Ali  Broadcom

Comment Type TR  Comment Status R

Max input differential p-p level of 1200 mV is not compatible with the SR4 and SR10, where both SRxx and CRxx serve the front panel market and some time on the same port!

SuggestedRemedy
Reduce max input level to 850 mV

Response  Response Status C
REJECT.

This comment was WITHDRAWN by the commenter.

Proposal inconsistent with Differential peak-to-peak output voltage (max.) 72.7.1.4 1200 mV.

Receiver specifications are summarized in Table 85-4 and detailed in 72.7.1.1 through 72.7.1.11 with the exception of the transmitter specified in 85.8.3.3

R574

Cl 85  SC 85.7.1  P 177  L 20  #
Ghiasi, Ali  Broadcom

Comment Type TR  Comment Status A

802.3ap backplanes support KX, KX4 and KR. CR4/CR10 are based on the 802.3ap and has the full provision to support another IEEE803.3ak (CX4)

SuggestedRemedy
Add badrate of 3.125 GBd to line 22. Duplicate Transition time line for CX4 with min value of 20 ps and max value of 130 ps . Add differential output voltage p-p 800 mV to 1200 mV for CX4

Response  Response Status C
ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.8.4 to subclause field]

This comment was WITHDRAWN by the commenter.

802.3ap already has support for KX4 operation which is simialr to CX4.

R575

Cl 85  SC 85.8.4  P 183  L 21  #
Ghiasi, Ali  Broadcom

Comment Type TR  Comment Status R

Since CR4/CR10 does not interface with KX there is no reason to have 1600 mV damage threshold

SuggestedRemedy
Remove 1600 mV damage threshold

Response  Response Status C
REJECT.

[Editor's note: corrected missing subclause number 85.8.4 to subclause field]

Not sure why this isn't usefull guidance.

For sub-task force discussion.

R576

Cl 85  SC 85.8.4  P 183  L 9  #
Ghiasi, Ali  Broadcom

Comment Type TR  Comment Status R

Support for CX4 is missing from the table. 802.3ap already has support for KX4 operation which is simialr to CX4.

SuggestedRemedy
Add Signaling rate of 3.125 GBd to table 85-5.

Response  Response Status C
REJECT.

This comment was WITHDRAWN by the commenter.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Not necessary in specifying the 40GBASE-CR4 and 100GBASE-CR10 PMD.
Cl 85  SC 85.9.1  P 185  L 16  # 577
Ghiasi, Ali  Broadcom
Comment Type  TR  Comment Status  R
3.125 Gb/s operation insertion loss missing
SuggestedRemedy
Add insertion loss limit from from 54-3.
Response  Response Status  C
REJECT.

This comment was WITHDRAWN by the commenter.

[Editor's note: corrected missing subclause number 85.9.1 to subclause field]

Cl 86  SC 86.4.2  P 204  L 51  # 578
Ghiasi, Ali  Broadcom
Comment Type  TR  Comment Status  A
Transmit function is missing AC coupling
SuggestedRemedy
Transmit function include AC coupling.
Response  Response Status  C
ACCEPT IN PRINCIPLE.
Give editor licence to modify the draft to include AC coupling in the PMD transmit side and receive side.

Cl 86  SC 86.4.3  P 205  L 29  # 579
Ghiasi, Ali  Broadcom
Comment Type  TR  Comment Status  A
AC coupling in CR4/CR10 are between TP4 and Chip which comes from legacy KR, specially with SR4/S10 defining the AC coupling in the module.
SuggestedRemedy
AC coupling need to be between TP3 and MDI
Response  Response Status  C
ACCEPT.

[Editor's note: corrected missing subclause number 85.9.3 to subclause field]
In some applications products will be developed dual purpose, 40GbE or 4 10GbE per CL 52. These products will be able to operate longer and on leacy OM1 and PM2 fibres. A note should be added to the reach with Ref to CL 52

Suggested Remedy
Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Response
REJECT.

Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Suggested Remedy
Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Response
REJECT.

Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Suggested Remedy
Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Response
REJECT.

Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Suggested Remedy
Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Response
REJECT.

Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Suggested Remedy
Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Response
REJECT.

Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.
IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

Draft 1.0 Comments

Comment

Cl 85 SC 85.7.1 P 177 L 30 # 556
Ghiasi, Ali Broadcom

Comment Type TR Comment Status A
Max and min loss between PMA IC and TP1a and TP4a are not defined, the link will not work if there is 10 dB loss on the PCB

Suggested Remedy
Loss from PMA function to TP1a and loss from TP4a to PMA function is SDD21<=(-0.0788 -0.6169*SQRT(f) - 0.5855*f)

Min loss
SDD>=2(6 - 2*f6)
Where is in GHz
The maximum SDD21 assumes the HCB PCB loss at Nyquist is <=1.0 dB

Response
Response Status C
ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.7.1 to subclause field]

Response Status C
Editors note:[Include cable assembly common mode return loss.]

Comment

Cl 86 SC 86.6.5 P 211 L 19 # 557
Ghiasi, Ali Broadcom

Comment Type TR Comment Status A
With stacked connector -6 dB SCC can not be met which could eliminated SR10

Suggested Remedy
Propose the following SCC2 mask
SCC2<= (-12 + 2.8*f) from 0.01 to 2.5 GHz and (-5.2+0.08*f) from 2.5 to 11.1 GHz.

Response
Response Status C
ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9.2 to subclause field]

Comment

Cl 85 SC 85.9.2 P 185 L 10 # 558
Ghiasi, Ali Broadcom

Comment Type TR Comment Status A
Cable assembly is missing common mode return loss parameter.

Suggested Remedy
Propose the following SCC22/SCC11 mask
SCC22<= (-12 + 2.8*f) from 0.01 to 2.5 GHz and (-5.2+0.08*f) from 2.5 to 11.1 GHz.

Response
Response Status C
ACCEPT IN PRINCIPLE.

Editors note:[Include cable assembly common mode return loss.]

Comment

Cl 85 SC 85.9.3 P 186 L 10 # 559
Ghiasi, Ali Broadcom

Comment Type TR Comment Status A
Cable assembly return loss does not specify if it is SCC or SDD but I am assuming it is Differential return loss.

Suggested Remedy
Propose to use SDD22/SDD11 per equation 83A-1

Response
Response Status C
ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9.3 to subclause field]

Suggested remedy comment#459

Add a new subclause titled "Common mode output reflection coefficient SCC22 at TP4 and TP1a" to define the following SCC22 mask
SCC22<= (-12 + 2.8*f) from 0.01 to 2.5 GHz and (-5.2+0.08*f) from 2.5 to 11.1 GHz.

Change the values of "Common mode output reflection coefficient, SCC22" in Table 86-11 to refer to new subclause.
85.8.4.1 Bit error ratio
The receiver shall operate with a BER 10-12 or better when receiving a compliant transmit signal, as defined in 85.8.3, through a compliant cable assembly as defined in 85.9 exhibiting the maximum insertion loss of 85.9.2. The cable assembly is normative. This approach is consistent with CX4.

In addition, Receiver characteristics are summarized in Table 85-5 and as detailed in 72.7.1.1 through 72.7.2.5 with the exception of the receiver characteristics specified in 85.8.4.1, 85.8.4.2, and 85.8.4.3.

---

**Response:**

This comment was WITHDRAWN by the commenter.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]
Cl 88 SC 88.3 P 246 L 17 # 595
Ghiasi, Ali Broadcom

Comment Type TR Comment Status R
PMD loopback function is missing

Suggested Remedy
Please add PMD loopback function

Response Response Status C
REJECT.

[Subclause changed from 3 to 88.3]

Providing an optical loopback is not really practical. Providing an electrical loopback function will constrain the implementation options for the PMD circuitry as it requires a 100 Gbit/s path from the Tx side to the Rx side. This was not a function included in 10GBASE-R PMDs

See also comment #594

Cl 83A SC 83A.3.4 P 286 L 41
Ghiasi, Ali Broadcom

Comment Type TR Comment Status A
Error rate for the Total jitter not defined

Suggested Remedy
Add note TJ defined at BER 1E-15

Response Response Status C
ACCEPT IN PRINCIPLE.

[Editors note state condition for total jitter error rate at 1E-15 is proposed]

Place note 83A.1.1

Cl 83A SC 83A.3.3 P 283 L 33 # 596
Ghiasi, Ali Broadcom

Comment Type TR Comment Status A
Error rate for the Total jitter not defined

Suggested Remedy
Add note TJ defined at BER 1E-15

Response Response Status C
ACCEPT IN PRINCIPLE.

[Editors note state condition for total jitter error rate at 1E-15 is proposed]

Place note 83A.1.1

Cl 83A SC 83A.3.4 P 286 L 46
Ghiasi, Ali Broadcom

Comment Type TR Comment Status A
Error rate for the Total jitter not defined

Suggested Remedy
Add note TJ defined at BER 1E-15 with value of 0.64 UI

Response Response Status C
ACCEPT IN PRINCIPLE.

Remedy provided in comment#596

Cl 83A SC 83A.3.3 P 283 L 12 # 599
Ghiasi, Ali Broadcom

Comment Type TR Comment Status R
With faster process 24 ps is becoming limits the desing options

Suggested Remedy
Change 24 ps Rise/Fall time to 20 ps

Response Response Status C
REJECT.

Technical justification needs to be provided to support comment. Concern that faster rise impact SI were voiced.

Cl 83A SC 83A.3.4 P 286 L 1225 # 600
Ghiasi, Ali Broadcom

Comment Type TR Comment Status A
Transmit compliance not yet defined

Suggested Remedy
Propose to use ghiasi_01_0708 min and max loss channel for transmitter compliance subset of s4p file cn be included in the draft for either soft testing or buildling actual boards

Response Response Status C
ACCEPT IN PRINCIPLE.

Remedy provided in comment#651.

Cl 83A SC 83A.3.4 P 286 L 1225 # 600
Ghiasi, Ali Broadcom

Comment Type TR Comment Status A
Interference tolerance test not yet defined

Suggested Remedy
Propose to use ghiasi_01_0708 min and max loss channelas the frequency dependent attenuator in 69A.2 test setup followed by a limiting Amplifier prior to interference injection. TP1 must have maximum jitter as defined in table 83A-1. Pre-emhasais can be adjusted to reach the TP4 J2=0.42 UI. Inteference generator then adjusted to increase the total jitter to value listed in table 83A-2

Response Response Status C
ACCEPT IN PRINCIPLE.

Add Editors note 83A.4.3.2 : [An interference tolerance test is required]
Comment Type: ER
Comment Status: A

Please replace `+-` with symbol

Suggested Remedy:
Replace with the frame symbol

Response
Response Status: C
ACCEPT.

Comment ID # 602
Cl: 83A SC: 3.4 P: 286 L: 33
Ghiasi, Ali Broadcom

Comment Type: ER
Comment Status: A

Please replace `+-` with symbol

Suggested Remedy:
Replace with the frame symbol

Response
Response Status: C
ACCEPT.

Comment ID # 603
Cl: 83A SC: 83A.3.3 P: 284 L: 50
Ghiasi, Ali Broadcom

Comment Type: TR
Comment Status: A

Total jitter at TP4 is 0.7 UI which is the same as SFP+ single channel. The SR4/SR10 optics are more relax than SR optics but the SerDes tolerance is the same.

Suggested Remedy:
The Total Jitter at TP4 for SR4 and SR10 should be 0.65 UI. Since CR4/CR10 TJ are 0.28 UI if the optical link does not close then TJ in table 86-6 and 86-7 are suggested to be reduced to 0.28 UI

Response
Response Status: C
ACCEPT IN PRINCIPLE.

Add an editor's note under table 86-11 to say that a proposal has been made to reduce the "Total Jitter output at TP4" in Table 86-11 to 0.65 UI. Supporting evidence for this would be required
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<td>606</td>
<td>T</td>
<td>A</td>
<td>The PMA Service Interface exists between the PMA client (the PCS or FEC sub-layer) and the uppermost PMA in a set of one or more stacked PMAs (possibly including an extender sub-layer). An extender sub-layer was not been defined by the baseline, though the XLAUI / CAUI can be perceived in this fashion.</td>
<td>SuggestedRemedy</td>
<td></td>
<td>AFTD</td>
</tr>
<tr>
<td>607</td>
<td>T</td>
<td>A</td>
<td>Add 40GBASE-LR4 to the definitions list in 1.4</td>
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<td>608</td>
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<td>A</td>
<td>update the text in 30.5.1.1.44 (802.3-2008) for 40 Gb/s and 100 Gb/s:</td>
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<td>update text in 30.5.1.1.15 aFECCorrectedBlocks for 40 Gb/s and 100 Gb/s</td>
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<td>41</td>
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<td>613</td>
<td>30.3.2.1.3</td>
<td>TR</td>
<td>27</td>
<td>21</td>
<td>C Ganga, Ilango</td>
<td>Response</td>
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See comment #150
Insert the following subclause 30.5.1.1.2 aMAUType and add 40G and 100G list

SuggestedRemedy
Insert the following to the aMAUType attribute list after 10GBASE-T:

- 40GBASE-R Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
- 40GBASE-KR4 40GBASE-R PCS/PMA over an electrical backplane PMD as specified in Clause 84
- 40GBASE-SR4 40GBASE-R PCS/PMA over 4 lane OM3 multimode fiber PMD as specified in Clause 86
- 40GBASE-LR4 40GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 87
- 100GBASE-R Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
- 100GBASE-CR10 100GBASE-R PCS/PMA over 10 lane shielded copper balanced cable PMD as specified in Clause 85
- 100GBASE-SR10 100GBASE-R PCS/PMA over 10 lane OM3 multimode fiber PMD as specified in Clause 86
- 100GBASE-LR4 100GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 88
- 100GBASE-ER4 100GBASE-R PCS/PMA over 4 WDM lane extended long reach single mode fiber PMD as specified in Clause 89

Update the Register names in first paragraph after BEHAVIOUR DEFINED AS

PMA/PMD control 2 register
PCS control 2 register

Change the last paragraph after BEHAVIOUR DEFINED AS as follows:
The enumerations 1000BASE-X, 1000BASE-XHD, 1000BASE-XFD, 10GBASE-X, 10GBASE-R, 10GBASE-W, 40GBASE-R and 100GBASE-R shall only be returned if the underlying PMD type is unknown.

Response ACCEPT.

See comment #150

Update the text in 30.5.1.1.4 (802.3-2008) for 40 Gb/s and 100 Gb/s:

SuggestedRemedy
Change following text in 30.5.1.1.4 aMediaAvailable after BEHAVIOUR DEFINED AS:

Any MAU that implements management of Clause 28 or Clause 73 Auto-Negotiation will map remote fault indication to MediaAvailable "remote fault."

Change following text in 30.5.1.1.4 aMediaAvailable after BEHAVIOUR DEFINED AS in last paragraph:

10/40/100GBASE-R PCS Latched high BER status bit (45.2.3.12.2)

Response ACCEPT.

See comment #150

Update attribute 30.6.1.1.5 aAutoNegLocalTechnologyAbility for 40G and 100G PHY types

SuggestedRemedy
Insert the following to the list after 10GBASE-KRF:

- 40GBASE-KR4FD Full duplex 40GBASE-KR4 as specified in Clause 84
- 40GBASE-CR4FD Full duplex 40GBASE-CR4 as specified in Clause 85
- 100GBASE-CR10FD Full duplex 100GBASE-CR10 as specified in Clause 85

Change the text after BEHAVIOUR DEFINED AS as follows:

This indicates the technology ability of the local device, as defined in Clause 28, Clause 37 and Clause 73.

Response ACCEPT.

See comment #150
Update 30B.2 ASN.1 module for CSMA/CD managed objects to add 40G and 100G PHY types

Suggested Remedy
Insert following 3 lines to the list "AutoNegTechnology::= ENUMERATED" as follows:
Insert after 1000GBASE-TFD:
40GBASE-KR4 (822), --40GBASE-KR4 PHY as defined in Clause 84
100GBASE-CR4 (821), --100GBASE-CR10 PHY as defined in Clause 85

REJECT.
See comment #619

Suggested Remedy
Insert following lines to the list after "TypeValue::= ENUMERATED" as follows:
Insert after 10GBASE-T:
40GBASE-R (821) Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
40GBASE-CR4 (822) 40GBASE-R PCS/PMA over an electrical backplane PMD as specified in Clause 84
40GBASE-CR4 (823) 40GBASE-R PCS/PMA over 4 lane shielded copper balanced cable PMD as specified in Clause 85
40GBASE-SR4 (824) 40GBASE-R PCS/PMA over 4 lane OM3 multimode fiber PMD as specified in Clause 86
40GBASE-LR4 (825) 40GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 87
100GBASE-R (8210) Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
100GBASE-CR10 (8211) 100GBASE-R PCS/PMA over 10 lane shielded copper balanced cable PMD as specified in Clause 85
100GBASE-SR10 (8212) 100GBASE-R PCS/PMA over 10 lane OM3 multimode fiber PMD as specified in Clause 86
100GBASE-LR4 (8213) 100GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 88
100GBASE-ER4 (8214) 100GBASE-R PCS/PMA over 4 WDM lane extended long reach single mode fiber PMD as specified in Clause 88

Response
REJECT.
See comment #619
Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

---

**Comment ID # 619**

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

Update 30B.2 ASN.1 module for CSMA/CD managed objects to add 40G and 100G PHY types.

**Suggested Remedy:**

Insert following lines to the list PhyTypeValue::= ENUMERATED:

- 40GBASE-R (82) --Clause 82 40 Gb/s multilane 64B/66B
- 100GBASE-R (821) --Clause 82 100 Gb/s multilane 64B/66B

**Response:** REJECT.

Given that project 802.3.1 will be taking responsibility for MIB updates based on the contents of Clause 30. Further changes to annexes 30A & 30B are no longer necessary.

---

**Comment ID # 620**

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

Service interface specification method and notation:

For all the service interfaces used in 802.3ba follow the definition used in 1.2.2 and be consistent with service interfaces used in the base specification (IEEE 802.3-2008).

This comment applies to Clause 82 to Clause 88.

In the base specification the only the parameters used in the primitive is a vector, none of the primitives are vectors. Whereas in 802.3ba the primitive is defined as a vector with just a single parameter. This is inconsistent with the base standard (IEEE Std 802.3-2008).

Change the service interface definition in 802.3ba to be consistent with the base standard.

**Suggested Remedy:**

For example the PMD service interface in Clause 86 is defined as follows:

PMD_UNITDATA.request<n:0>(tx_bit), i=0..n
or in otherwords
PMD_UNITDATA.request0(tx_bit0)
PMD_UNITDATA.request1(tx_bit1)
...
PMD_UNITDATA.requestn(tx_bitn)

Instead define the primitives with parameter as vectors as in 802.3-2008.

PMD_UNITDATA.request(tx_bit<n:0>)
or in otherwords
PMD_UNITDATA.request(tx_bit, .. tx_bit2, tx_bit1, tx_bit0)

**Response:** ACCEPT IN PRINCIPLE.

This comment affects Clauses 80 through 88.

For example change to:

PMD_UNITDATA.request0(tx_bit)
PMD_UNITDATA.request1(tx_bit)
...
PMD_UNITDATA.requestn(tx_bit)

and equivalent change to the receive side
except for the service interface between the RS and PCS which remains how it is currently defined.

Grant editorial license to make the necessary changes to accommodate this update.

What is the inherent reason to use ER of 4dB, which seems obviously odd?

SuggestedRemedy
suggest to change ER as 3.5dB or 6dB which look more realistic. (need to re-calculate the launch power numbers accordingly).

Also RIN to be -132dB/Hz is tough, suggest -128dB/Hz.

The ER of 4 dB was in the adopted baseline proposal. The suggested remedy has values that are both higher and lower than the current value suggesting that there is no good technical justification for the change.

The RIN value of -132 dB/Hz comes from the 128 dB/Hz requirement for 10GBASE-LR scaled by the relative receiver bandwidths. Using a value of 128 dB/Hz would significantly increase the penalty due to this effect.

The commenter is invited to bring technical justification for these proposals.

The penalty due to crosstalk in the receiver is the responsibility of the receiver. It is not necessary (or desirable) to specify this crosstalk penalty. This penalty is taken in to account when a realistic value is set for the required sensitivity. Crosstalk in the transmitter is part of the penalty, but is assumed to be small. This is assumed to be an EA modulated laser with lower penalties than direct mod laser assumed in 10G-BASE-LR. The 26 dB return loss of the receiver will make the reflection penalty less than that for 10G_BASE-LR

The ER of 8 dB was in the adopted baseline proposal. The suggested remedy has values that are both higher and lower than the current value suggesting that there is no good technical justification for the change.

The RIN value of -132 dB/Hz comes from the 128 dB/Hz requirement for 10GBASE-LR scaled by the relative receiver bandwidths. Using a value of 128 dB/Hz would significantly increase the penalty due to this effect.

The commenter is invited to bring technical justification for these proposals.
In table 83-1, some PMA stage examples become irrelevant such as 4 inputs to 1 outputs to cover 40 g serial in 40GBASE-R transmit (& Receive), or 4(5) inputs to 1 outputs to cover 100 g serial in 100GBASE-R transmit (& Receive).

Suggested Remedy:
Suggest take them out from the table.

Response
Accept.

Need to reconcile with multiple comments on this table: comments #467, #624, #42, #43 plus a related comment #625.

Since the TF decide not to define optical modules with 2x20g or 40g, so feel it is not appropriate to define the possible numbers of input of 2, 1 for 40GBASE-R. Same for 100GBASE-R with 2, 1.

Suggested Remedy:
Suggest to take it out.

Response
Accept in principle.

Overtaken by events - table 83-1 is removed. The sentence can be removed entirely since it replicates one in 83.1.3

Feel "provide test generation and detection" not sufficient.

Suggested Remedy:
Change to "provide build-in-self-test (BIST) function with test pattern generator and checker"

Response
REJECT.

[Changed subclause from 1.3 to 83.1.3]

BIST would be a new function that requires a presentation to justify adding the feature and to specify its operation. It depends on implementation architecture and is not normally considered in the scope of 802.3 standardization.

Overtaken by events - loopback and other aspects will be described differently than in the previous draft. Where a similar concept is described, it should be clarified that the top of the stack is the PMA closest to the PCS while the bottom of the stack is the PMA closest to the PMD.
In 83.6.6, PMA loopback mode should support lineside loopback and diagnostic loopback functions.

**Suggested Remedy**
Suggest to define two kinds of loopback. In addition to lineside loopback illustrated in Fig 83-5, add the host-side loopback as 2nd option.

**Response**
Overtaken by events. See 643.

Agree with Editor comment on PRBS31 pattern is too long.

**Suggested Remedy**
Suggest to add short patterns like PRBS7, PRBS9 or even CJPAX etc in the text. (PRBS9 is well established in LRM.)

**Response**
ACCEPT IN PRINCIPLE.

See comment #232 for editor's note to be added

Table 86-8 need more rows, lack parameters.

**Suggested Remedy**
Add row for "Average lanch power, each lane" with a Min value of "TBD" Change the "Optical return loss tolerance" to be a Max value Change the value of "RIN12OMA" to be "-128 db/Hz"

**Response**
ACCEPT IN PRINCIPLE.

Allocation for penalty state TBD, which should be 8.3-1.9=6.4dB, the difference as compared with 10GABSE-SR should come related to the contribution from channel-to-channel xtalk.

**Suggested Remedy**
Pls clarify.

**Response**
ACCEPT IN PRINCIPLE.

See remedy of comment # 410.

Change footnote "a" from "Specified in IEC 60793-2-10" to "Specified in IEC 60793-2-10. See 86.10.2.1"
Cl 87  SC 87.6.3  P 232  L 17  # 633
CHANG, Frank  Vitesse

Comment Type  TR  Comment Status  A  Optical

edits in table 87-8,

SuggestedRemedy
- Suggest the change:
  - Feel Rx reflectance should be MAX, not min specs.
  - Add Stress eye jitter specs as condition for SRS.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

[Editor's note: Note Page number and line corrected to point to Table 87-8]

Change to 'Receiver reflectance (max)'
In table 87-8 add row for stressed eye jitter and format this together with the vertical eye closure in a similar way to table 86-11

Cl 87  SC 87.6.3  P 233  L 2  # 634
CHANG, Frank  Vitesse

Comment Type  TR  Comment Status  R  Optical

In Table 87.9, Allocation for penalties sound too optimistic. 10GBase-L allocate 3.2dB while LR4 is only 2.3dB with xtlk.

SuggestedRemedy
- Suggest to consider 4-4.2dB, and change RX parameters in Table 87-8 accordingly.

Response  Response Status  C
REJECT.

The allocation for penalties was part of baseline proposal adopted by the task force. The commenter is invited to present evidence to the task force to support a change in values.

Cl 88  SC 88.6.2  P 252  L 24  # 635
CHANG, Frank  Vitesse

Comment Type  TR  Comment Status  A

In Table 88-8, RX reflectance should not be MIN specs. Also need Stress eye jitter specs as condition for SRS test.

SuggestedRemedy
- Change RX reflectance as MAX specs.
- Also Stress eye jitter specs as condition for SRS test.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Change to 'Receiver reflectance (max)'
In table 88-8 add row for stressed eye jitter and format this together with the vertical eye closure in a similar way to table 86-11

Cl 88  SC 88.7.2  P 255  L 21  # 636
CHANG, Frank  Vitesse

Comment Type  TR  Comment Status  A

In Table 88-12, RX reflectance should not be MIN specs.

SuggestedRemedy
- Change RX reflectance as MAX specs. Add Stress eye jitter as condition to SRS test.

Response  Response Status  C
ACCEPT IN PRINCIPLE.
Change to 'Receiver reflectance (max)'
In table 88-12 add row for stressed eye jitter and format this together with the vertical eye closure in a similar way to table 86-11
In Table 88-13, the penalties for 40km sound too optimistic, which should show larger penalty than 30km.

Suggested Remedy
The penalties for 40km should be 0.5dB higher than 30km, also suggest to change 40km IL as 16dB, as the IL is too pessimistic, keeping in mind ER4 has very tight link budget.

Response
REJECT.

The allocation for penalties for the 40 km case has been supported by various contributions to the Task Force. Reducing the penalties for the 30 km case achieves little as it simply increases the additional insertion loss allowed.

If we assume 1.5 dB for connector loss, then the 18 dB insertion loss gives 16.5 dB for the loss of the fibre and splices. From the data used to produce slide 10 of anslow_01_0307.pdf referred to 1295 nm this covers about 70% of installed 40 km links. If we reduce the insertion loss from 18 dB to 16 dB, then we only get 14.5 dB for the loss of the fibre and splices. From the same data set as above, this only covers 6% of real installed links. Even reducing the connector loss to 1 dB results in a coverage of only 16% of links.

I don't agree XLAU or CAUI is just for chip-to-chip interconnect, this is only true for nx10g MMF module with non-retimed interface. For optical 4x25g SMF or 4x10g X40 modules, CAUI or XLAU could be interface connecting optical modules to host ASIC board.

Suggested Remedy
Suggest the change as:

The purpose of the XLAUI or CAUI is to provide a flexible chip-to-chip interconnection as well as the connection between optical module and host ASIC board..........n

See comment #143 which contains a suggested remedy.

Suggested Remedy
Add Protocol implementation conformance statement (PICS) proforma to the end of the Clauses 82 to 88 and annex 83A.

Suggested Remedy
Add Protocol implementation conformance statement (PICS) proforma to the end of the Clauses 82 to 88 and annex 83A.

Suggested Remedy
Add Protocol implementation conformance statement (PICS) proforma to the end of the Clauses 82 to 88 and annex 83A.
A PMA is always bidirectional and contains both Transmit and Receive functions. So calling this as a separate RX PMA and a TX PMA is confusing and this is not consistent through out the clause. In some references in this clause the PMA implies both for e.g 20:10 PMA which includes both TX and RX PMA.

So instead of referring this as RX and TX PMA, simply define the PMA as a single block which includes both Transmit and Receive functions. This methodology is consistent with the definitions of PCS/PMA/PMD which are all bidirectional with TX and RX functions.

**Suggested Remedy**

Define the PMA as a single block which includes both Transmit and Receive functions, illustrated in Fig 83-3 as single PMA block with TX and RX blocks inside the PMA. The TX function in the PMA connects to p input lanes and q output lanes. The RX function in the PMA connects to q input lanes and p output lanes. In this case the link status is associated with the RX function.

Also Change Fig 83-4 to illustrate both TX and RX functions

Also for primitives, the TX function can use PMA_UNIDATA.request and the RX function use PMA_UNIDATA.indication in the following manner

Transmit direction for data flowing from MAC to MDI

```
PMA_UNIDATA.request_in
PMA_UNIDATA.request_out
```

Receive direction

```
PMA_UNIDATA.indication_in
PMA_UNIDATA.indication_out
```

Signal indication

```
PMA_SIGNAL.indication_in
PMA_SIGNAL.indication_out
```

So this can be consistently mapped to the request and indication of PMD primitives or FEC primitives

Accordingly, update the text description and primitive definitions in 83.3

**Response**

We discussed this in trowbridge_01_0708. There is a great deal of text that gets replicated if the general operation of m input lanes to n output lanes needs to be described twice because it occurs in Tx and Rx directions. The primitive naming all changes also if this proposal is accepted.

Nicholl, Gary Cisco

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

I would like to see a PMA line loopback (by which I mean data loopback from/to the PMD service interface) as a mandatory requirement. This is something that was not included in the original 802.3ae spec (10GE), but is widely implemented and used by the industry (primarily for PMD compliance testing).

**Suggested Remedy**

I will be making a contribution in Dallas to propose a remedy.

**Response**

ACCEPT IN PRINCIPLE.

[Changed subclause from 1.3 to 83.1.3] An optional PMA line loopback at the lowermost PMA level (nearest the PMD). The loopback would use the received clock for the transmit side and loop back the data on a per PMA lane basis. Also add in appropriate MDIO register to control the loopback if it is implemented. Change the name of the current PMA loopback to "system PMA loopback" in order to differentiate it from the line loopback. Editorial license to fit it into the text in the appropriate place. Add a similar figure to 83-5 but in the opposite direction to explain line loopback operation. Line loopback and system loopback should each have two MDIO bits: one to indicate whether line/system loopback is supported and the other to enable.
Do we need to specify what BER the Receiver sensitivity (OMA) parameter is specified for? I am assuming that it is BER=10^-12 (same as stressed receiver sensitivity)?

We also need to clarify if this is the raw BER on the line or whether it is the effective BER after the error multiplication of the scrambler is taken into consideration (in which case the BER on the line is a factor of 3 less than specified). If it is indeed the former then we need to specify a way that it can be tested as this was an issue that came up in 10GE testing.

Suggested Remedy
One possible solution would be to define an unframed PRBS test mode with no 64/66B encoding or scrambling enabled, to be used for testing all of the PMD optical parameters. However I am not sure how this would work for a MLD based interface (which needs the 64/66B encoding and MLD lane markers to operate)?

---

In keeping with nicholl_02_0508 and the follow-up discussion at the Munich meeting I would like to request that the size of the BER be increased from 6 bits to at least 24 bits.

Suggested Remedy
I will be providing a contribution in Dallas with a suggested remedy

Response
ACCEPT IN PRINCIPLE.

See also comment #646

Notwithstanding that the TF will review presentation and in the absence of an alternative at this time, the editor suggests:

Add 2 registers - 3.44, 3.45
3.44 BER high order
3.45 Errored blocks high order

Each register is defined in tandem with the existing 8 bit counters. The high order counter contains bits 23:8 and the value latches on read of the lower 8 bits (status register 2). The counter also resets on read of status register 2. These bits shall be held at all ones in the case of overflow.

Also change the last sentence of 45.2.3.12.3 & 45.2.3.12.4 to "If the [corresponding high order register] is not implemented then these bits shall be held at all ones in the case of overflow."

Also look at text for multi-word registers in the beginning of Clause 45 to make the best editorial solution. Make sure that the new function is for 40/100 only. Consider ability indication.
In keeping with nicholl_02_0508 and the follow-up discussion at the Munich meeting I would like to request that the size of the Errored Block counter be increased from 8 bits to at least 24 bits.

Suggested Remedy

I will be providing a contribution in Dallas with a suggested remedy.

RESPONSE

ACCEPT IN PRINCIPLE.

Remedy provided in #562.

Pulse width jitter (PWJ) is needed at about 8Gbps or above to avoid jitter amplification (JA) due to the lossy channel. If PWJ is not defined and bounded, nXAUI link will break in the presence of large PWJ.

Suggested Remedy

PWJ needs to be defined and specified. I suggest that 802.3ba adopt the definition and value similar to those of Fibre Channel 8X and PCIe Gen 3.

RESPONSE

ACCEPT IN PRINCIPLE.

Remedy provided in #562.

The frequency spectrum content needs to be specified. Otherwise one may use a easy spectrum jitter input (e.g., low frequency dominated) to pass the receiver tolerance test, while such a receiver will fail in the presence of worst case jitter input spectrum (e.g., high-frequency DCD, ISI, Xtalk, or RJ) in real-world.

Suggested Remedy

A technical proposal is needed and approved to address this important aspect for Rx.

RESPONSE

ACCEPT IN PRINCIPLE.

Add editor's note: in jitter test methodology need a proposal to use a reference clock recovery unit.

BER for the nAUI link needs to be defined

Suggested Remedy

A proposal on the BER for nXAUI is needed and approved.

RESPONSE

ACCEPT IN PRINCIPLE.

Remedy provided in #596.
Comments

IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

Comment ID # 650

Comment Type TR
Comment Status A
Non-Eq jitter is NOT (TJ-ISI) and needs to be well-defined, and (TJ-ISI) needs to be removed.

Suggested Remedy
remove TJ-ISI for non-EQ jitter and spell-out and exactly what is No-EQ jitter e.g., DCD, PJ, BUJ, RJ).

Response Response Status C
ACCEPT IN PRINCIPLE.

Remedy provided in #562.

Comment ID # 651

Comment Type TR
Comment Status A
Transmitter equalization is not defined. As such channel jitter will be specified with the assumption that ISI is not compensated. This will eat the DJ margin of Tx and Rx while most of them today have the equilization capabilities.

Not defining equilization will result in expensive nXAUI specification, with ready silicon equalization unused.

Suggested Remedy
Technical proposal is needed and approved to determine what type of equilization is best suitable for nXAUI channel (Tx, Rx, Tx+Rx) in terms of cost and performance.

Response Response Status C
ACCEPT IN PRINCIPLE.

Add Editors note: [83A.3.3- transmitter eyemask as defined in figure 83A-5 is not considered a sufficient description to guarantee performance; additional test methods are required]

Comment ID # 652

Comment Type TR
Comment Status A
Jitter transfer function (JTF) is not defined for Tx jitter definition/testing. This will grossly oversetimate the jitter, leaving the jitter margin created by clock and data recovery (CDR) unused, resulting in expensive nXAUI specification.

Suggested Remedy
Technical proposal for JTF associated with CDR is needed and approved.

Response Response Status C
ACCEPT IN PRINCIPLE.

Add to 83A.4.3.1 - The clock recovery unit (CRU) used in the transmit jitter measurement has a corner frequency of less than or equal to 4 MHz and a slope of -20 dB/decade (need figure consistent with text). When using a CRU as a clock for jitter measurements.