Cl **00** SC **0** P L # 21
McClellan, Brett Marvell

Comment Type **E** *Comment Status* **A** *Editorial - references*

subclause headers don't match 802.3-2012
for example 45.2.1.66 in draft 1.0 is register 1.129 but in 802.3-2012 it is reg 1.134. 45.2.3.12 in draft 1.0 is 3.10.20 in 802.3-2012 it is 3.25.
Are the headers in the draft supposed to reference 802.3-2012? or to a later amendment?

SuggestedRemedy

check that headers are correct

Response *Response Status* **C**

ACCEPT.- EDITORIAL TEAM TO CHECK HEADERS AND IMPLEMENT

Cl **28** SC **28.5.4.8** P **8** L **26** # 60
Zimmerman, George CME Consulting, Inc.

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

Autoneg requires additional changes:
Link fail inhibit timer is defined for 10/100/1000 (SD11) & separately for 10G (SD11a)

SuggestedRemedy

Extend definition of SD11a in 28.5.4.8 to include M: 40G (mandatory for 40G)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Additionally modify table 28-9 in 28.3.2 to define 10GBASE-T link_fail_inhibit_timer properly.

Cl **28B** SC **28B.3** P **9** L **1** # 61
Zimmerman, George CME Consulting, Inc.

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

Add 40GBASE-T to autoneg priority resolution

SuggestedRemedy

Add edit to normative Annex 28B, clause 28B.3 to insert 40GBASE-T above 10GBASE-T on the priority resolution list and renumber list accordingly

Response *Response Status* **C**

ACCEPT.

Cl **28C** SC **28C.11** P **9** L **2** # 62
Zimmerman, George CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Autoneg*

name of message code in 28C.11 doesn't include 10GBASE-T
also listed as code 9 in Table 28C-1 doesn't include 10GBASE-T

SuggestedRemedy

Change message code 9 name from: "10GBASE-T/1000BASE-T Technology message code (Extended Next Page)" to:
"Gigabit BASE-T Technology message code (Extended Next Page)"

Include 40GBASE-T (Clause 98) in the list of referenced clauses in 28C.11

Make appropriate changes to Clauses, 40, 55, and 98 to reflect the name change
(see comment on 98.6.2)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
- see comments 101 & 102
Change message code 9 to: "xGBASE-T Technology message code (Extended Next Page)"
Change "Message Code Description" in Table 28C-1 to "xGBASE-T Technology message code (Extended Next Page)"

Include 40GBASE-T (Clause 98) in the list of referenced clauses in 28C.11

Make appropriate changes to Clauses, 40, 55, and 98 to reflect the name change
(see comment on 98.6.2)

Cl **28D** SC **28D.6** P **9** L **1** # 63
Zimmerman, George CME Consulting, Inc.

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

Annex 28D.6, changes for 10GBASE-T needs to also include 40GBASE-T

SuggestedRemedy

Insert section 28D.7 with same text as 28D.6 and change references to reflect 40GBASE-T and Clause 98, including variable 40GigT

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert as section 28D.8, with same text as 28D.6 and change references to reflect 40GBASE-T and Clause 98, including variable 40GigT

Cl **30** *SC* **30.2.5** *P* **9** *L* **1** # 64

Zimmerman, George CME Consulting, Inc.

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

Clause 30, requires minor changes:
1. extending 10G operating margin package to 40G (Table 30-1e "10GBASE-T operating margin package")
2. include 40GBASE-T Clause 98 in 30.3.2.1.2aPhyType and 30.3.2.1.3 aPhyTypeList
3. Edit 10GBASE-T SNR margin and fast retrain counts to include 40GBASE-T as well
4. Add 40GBASE-T to 30.6.1.1.5 aAutoNegLocalTechnologyAbility

SuggestedRemedy

1. Change label of column in Table 30-1e to "10G/40GBASE-T operating margin package (conditional)"
2. Add 40GBASE-T Clause 98 in 30.3.2.1.2aPhyType and 30.3.2.1.3 aPhyTypeList
3. Edit 30.5.1.1.19 through 30.5.1.1.22, and 30.5.1.1.24 & 25 to include 40GBASE-T with 10GBASE-T
4. Add 40GBASE-T to 30.6.1.1.5 aAutoNegLocalTechnologyAbility list

Response *Response Status* **C**

ACCEPT.

Cl **31B** *SC* **31B.3.7** *P* **9** *L* **2** # 65

Zimmerman, George CME Consulting, Inc.

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

Consider whether 40GBASE-T needs special treatment for PAUSE operation, as 10GBASE-T did relative to other 10G PHYs.

SuggestedRemedy

Discuss - no specific remedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
10GBASE-T is specified as 76 pause quanta bit times, and all 40G PHYs are specified as 118 pause quanta bit times. Since 40GBASE-T latency is equal to 10GBASE-T latency in BT, this should be acceptable.

Cl **45** *SC* **45.2.1** *P* **10** *L* **20** # 67

Zimmerman, George CME Consulting, Inc.

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

Missing "/"

SuggestedRemedy

Change to 10GBASE-T/40GBASE-T

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.66** *P* **13** *L* **3** # 66

Zimmerman, George CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Control/Status bits*

subclause appears to relate only to register 1.129, although title is amended to add "and 1.130"

SuggestedRemedy

Delete "and 1.130" from title

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.66.2** *P* **13** *L* **13** # 68

Zimmerman, George CME Consulting, Inc.

Comment Type **T** *Comment Status* **A** *Control/Status bits*

No need for both a 10GBASE-T LP information valid bit and a 40GBASE-T LP information valid bit. This also includes Table 45-54

If the new bit for 40GBASE-T is to be kept, paragraph references the wrong (10GBASE-T) bit on line 17.

SuggestedRemedy

Delete inserted paragraph, and edit paragraph 45.2.1.66.1 10GBASE-T LP information valid (1.129.0) to be "40/10GBASE-T LP information valid"

IF the paragraph is not deleted, correct the reference on line 17 to bit 1.129.0 which should be 1.129.1

Response *Response Status* **C**

ACCEPT.
Delete inserted paragraph, and edit paragraph 45.2.1.66.1 10GBASE-T LP information valid (1.129.0) to be "40/10GBASE-T LP information valid"

See comment 22 as well

Cl **45** SC **45.2.1.66.2** P **22** L **13** # 22
McClellan, Brett Marvell

Comment Type **T** *Comment Status* **A** *Control/Status bits*

45.2.1.66.2 40GBASE-T LP information valid (1.129.1)
Adding a new bit for 40G seems unnecessary, can we reuse the 10GBASE-T bit, 1.129.0? Otherwise we need to search and replace instances of 1.129.0 and replace with 1.129.1. See page 23 line 8.

SuggestedRemedy

delete bit 1.129.1 and rename 1.129.0 10/40GBASE-T LP information valid

Response *Response Status* **C**

ACCEPT.
See comment 68

Cl **45** SC **45.2.1.68.1** P **23** L **8** # 123
Lusted, Kent Intel

Comment Type **ER** *Comment Status* **A** *Control/Status bits*

The last sentence references the LP information valid bit 1.129.0 and the TX power backoff bits. backoff bits are now defined for 10GbT and 40GbT. however, the 1.129.0 bit is now the 10GBASE-T LP information valid bit. Another bit is defined for 40GBASE-T (1.129.1).

SuggestedRemedy

Add reference to 1.129.1, which is the 40GBASE-T LP information valid bit.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Accomodated by comment #22, no change required

Cl **45** SC **45.2.3.1.2** P **25** L **10** # 124
Lusted, Kent Intel

Comment Type **ER** *Comment Status* **A** *Editorial - references*

Link to 98.3.6.3 is to wrong section. Loopback is 98.3.7.3.

Note that the sentence immediately preceeding it for 10GBASE-T incorrectly references 55.3.6.3. The correct 10GBASE-T reference is 55.3.7.3.

SuggestedRemedy

Point to 98.3.7.3

Response *Response Status* **C**

ACCEPT.
Recommend Commenter submit maintenance request on 10GBASE-T reference

---

Cl **45** SC **45.2.3.12** P **17** L **28** # 69
Zimmerman, George CME Consulting, Inc.

Comment Type **TR** *Comment Status* **A** *Control/Status bits*

40GBASE-T EEE deep sleep is not supported in clause 98

SuggestedRemedy

Delete section 45.2.3.12

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
- RESOLVED BY COMMENT 23

Cl **45** SC **45.2.3.12** P **26** L **29** # 23
McClellan, Brett Marvell

Comment Type **E** *Comment Status* **A** *Control/Status bits*

"45.2.3.12 40GBASE-T EEE deep sleep supported (3.20.10)" doesn't match other EEE capability bit names.

SuggestedRemedy

change to:
"45.2.3.12 40GBASE-T EEE supported (3.20.10)"

Response *Response Status* **C**

ACCEPT.
- SEE COMMENT 69

Cl **45** SC **45.2.3.17** P **17** L **40** # 70
Zimmerman, George CME Consulting, Inc.

Comment Type **ER** *Comment Status* **A** *Editorial - technical*

Description says that a device that does not implement BASE-R, 10GBASE-T, AND (emphasis added) 40GBASE_T ...

(FYI - same error is in the existing 802.3-2012)

while the bit is for BASE-R and 10GBASE-T currently, it isn't meant to mean that a device must implement ALL of the above, as an AND would indicate.

SuggestedRemedy

change "and 40GBASE-T" to "or 40GBASE-T"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.17.4** *P* **27** *L* **40** # 125

Lusted, Kent — Intel

Comment Type **ER** *Comment Status* **A** *Editorial - references*

Link to 98.3.6.1 is to wrong section. Variables is 98.3.6.2.2, or least in section 98.3.6.2. The variable hi_lfer is not in 98.3.6.1.

Note that the sentence immediately preceeding it for 10GBASE-T incorrectly references 55.3.6.1. The correct 10GBASE-T reference is 55.3.6.2.

SuggestedRemedy

Point to 98.3.6.2.2 or 98.3.6.2

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.17.5** *P* **27** *L* **52** # 126

Lusted, Kent — Intel

Comment Type **ER** *Comment Status* **A** *Editorial - references*

Link to 98.3.2.3 is to wrong section. Variable definitions is 98.3.6.2.2, or least in section 98.3.6.2. The variable block_lock is not in 98.3.2.3.

Note that the sentence immediately preceeding it for 10GBASE-T incorrectly references 55.3.2.3. The correct 10GBASE-T reference is 55.3.6.2.

SuggestedRemedy

Point to correct section.

Response *Response Status* **C**

ACCEPT.
Recommend Commenter submit maintenance request on 10GBASE-T reference

Cl **45** *SC* **45.2.7.10** *P* **20** *L* **39** # 71

Zimmerman, George — CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Editorial*

subject (assignment of bits) and verb (are) should agree - subject is (still) singular. (no need to change "is" to "are")

SuggestedRemedy

reverse proposed deletion of "is" to replace with "are"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.7.10.6** *P* **30** *L* **28** # 24

McClellan, Brett — Marvell

Comment Type **T** *Comment Status* **D** *Fast Retrain*

Task force should consider making fast retrain mandatory.

SuggestedRemedy

If made mandatory, delete subclauses
45.2.7.10.6 40GBASE-T Fast retrain ability (7.32.3)
45.2.7.11.10 40GBASE-T Fast retrain ability (7.33.0)
modify tables accordingly
delete references to fast retrain "option" in Clause 98

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

- DISCUSS WITH COMMENT 52
(DEFERRED UNTIL AFTER LUNCH)

Cl **45** *SC* **45.2.7.11.1** *P* **31** *L* **29** # 127

Lusted, Kent — Intel

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

Added sentences uses "10GBASE-T" but should be "40GBASE-T".

SuggestedRemedy

Change to "40GBASE-T"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **Table 45-7** *P* **20** *L* **21** # 121

Lusted, Kent — Intel

Comment Type **E** *Comment Status* **A** *Editorial*

Description adds "40GBASE-T PMA" but the correct type selection should be "40GBASE-T PMA/PMD".

Listing PMA/PMD makes it consistent with 10GBASE-T, 1000BASE-T, 100BASE-TX, and other listings in Table 45-7

SuggestedRemedy

Change to "40GBASE-T PMA/PMD".

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78** *P* **73** *L* **5** # 72

Zimmerman, George — CME Consulting, Inc.

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

Clause 78 has template text throughout, which needs to be cleaned out

SuggestedRemedy

Clean out template text showing formates for paragraphs,etc.

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.1** *P* **73** *L* **14** # 47

Zimmerman, George — CME Consulting, Inc.

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

While phy implementations may or may not support EEE, in the standard, EEE as a protocol supports the phys.

SuggestedRemedy

reverse edit to read "EEE supports the 100BASE-TX PHY, ..., and the 40GBASE-T PHY".

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.3** *P* **38** *L* **1** # 25

McClellan, Brett — Marvell

Comment Type **E** *Comment Status* **A** *Editorial - references*

"Table 78–2—Clauses associated with each interface type"
title is incorrect

SuggestedRemedy

change to:
"Table 78–2—Summary of the key EEE parameters for supported PHY"

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.3** *P* **74** *L* **1** # 48

Zimmerman, George — CME Consulting, Inc.

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

Table 78-2 seems to have gotten the title of 78-1. In 802.3-2012, it is "Summary of the key EEE parameters for supported PHY"

SuggestedRemedy

Replace title of Table 78-2 with "Summary of the key EEE parameters for supported PHY"

Response *Response Status* **C**

ACCEPT.
See Comment 25

Cl **78** *SC* **78.4** *P* **38** *L* **33** # 26

McClellan, Brett — Marvell

Comment Type **E** *Comment Status* **A** *Editorial*

pages 38 to 41 have unrelated editorial notes

SuggestedRemedy

remove this section

Response *Response Status* **C**

ACCEPT.
(see comment 72)

Cl **98** *SC* **98.1** *P* **12** *L* **28** # 49

Zimmerman, George — CME Consulting, Inc.

Comment Type **T** *Comment Status* **A** *Cabling references*

Reference to media in ISO/IEC 11801:2002 is inappropriate - should be to Ed 3 draft

SuggestedRemedy

Replace reference with reference to ISO/IEC 11801 Edition 3 and ANSI/TIA-568-C.2-1-201x Addendum 1: Specifications for 100ohm Category 8 Cabling

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.1.1** *P* **28** *L* **34** # 50

Zimmerman, George — CME Consulting, Inc.

Comment Type **ER** *Comment Status* **A** *Editorial - Discuss*

Remove editors notes in section

SuggestedRemedy

Remove editors notes under objectives

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.1.3** *P* **30** *L* **24** # 52

Zimmerman, George — CME Consulting, Inc.

Comment Type **T** *Comment Status* **A** *Fast Retrain*

There have been no contributions to remove fast retrain

SuggestedRemedy

Delete editors note

Response *Response Status* **C**

ACCEPT.
- see comment 27 & 83

Cl **98** *SC* **98.1.3** *P* **30** *L* **9** # 51

Zimmerman, George — CME Consulting, Inc.

Comment Type **T** *Comment Status* **A** *Loop timing*

There are no known instances of 10GBASE-T implementing the alternate non-loop timed version. there has been no discussion that non-loop timed 40GBASE-T is technically feasible.

SuggestedRemedy

Remove references to optional loop timing in paragraph. (replace "may include" with "includes", delete "If loop timing is implmeented,", delete sentence beginning with "If loop timing is not implemented"

Response *Response Status* **C**

ACCEPT.
Loop timing for 40GBASE-T is mandatory

Cl **98** *SC* **98.1.3** *P* **47** *L* **10** # 27

McClellan, Brett — Marvell

Comment Type **T** *Comment Status* **A** *Loop timing*

"The MASTER-SLAVE relationship may include loop timing. If loop timing is implemented, the SLAVE PHY recovers the clock"
Loop timing is required if EEE is supported. Task force should consider making loop timing required for 40GBASE-T to eliminate an option that likely will never be used (as in 10GBASE-T).

SuggestedRemedy

If made mandatory, change text to:
"The MASTER-SLAVE relationship requires. The SLAVE PHY recovers the clock"
modify othere references in Clause 98 as required.

Response *Response Status* **C**

ACCEPT.
- see comment 51 for other references

Cl **98** *SC* **98.1.3** *P* **47** *L* **4** # 28

McClellan, Brett — Marvell

Comment Type **E** *Comment Status* **A** *PMA General*

symbol period is 312.5ps not 325ps

SuggestedRemedy

change "325" to "312.5"

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.1.3.1** *P* **33** *L* **9** # 53

Zimmerman, George — CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Editorial - Discuss*

Editors note flagging the clause has done its job

SuggestedRemedy

Delete editors note

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.1.3.1** *P* **50** *L* **22** # 122

Lusted, Kent — Intel

Comment Type **E** *Comment Status* **A** *Editorial*

The term "RS(140, 136, 2^11) code" is used without defining what RS is. The 802.3-2012 base standard abbreviation list says RS is Reconciliation Sublayer. That doesn't make sense in this section where the text uses "RS-coded bits". RS must mean Reed Solomon.

SuggestedRemedy

Please define the use of RS in this section as Reed Solomon, if necessary.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
- Edit first usage in line 49 to read:
"comprising 3 RS-encoded (Reed-Solomon-encoded) bits and 4 LDPC-encoded"…

Cl **98** *SC* **98.1.4** *P* **35** *L* **34** # 54

Zimmerman, George — CME Consulting, Inc.

Comment Type **TR** *Comment Status* **A** *Editorial-technical*

bit width of TXD, TXC, RXD, RXC are incorrect for XLGMII

SuggestedRemedy

Replace TXD<31:0> with TXD<63:0>, RXD<31:0> with RXD<63:0>, TXC<3:0> with TXC<7:0>, and RXC<3:0> with RXD<7:0>

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.12.7** *P* **146** *L* **15** # 9

Larsen, Wayne — CommScope

Comment Type **E** *Comment Status* **A** *PICS*

To align with the terminology used in clause 98.7.

SuggestedRemedy

in table entries LKS6, LKS7, and LKS15, change "FEXT" to "ACRF"

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.12.7** *P* **146** *L* **24** # 10

Larsen, Wayne — CommScope

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

To align the contents of this table with clause 98.7. The items listed are not included in clause 98.7.

SuggestedRemedy

Delete table entries LKS12, LKS13, LKS14, LKS16, LKS17, LKS18, and LKS19.

Response *Response Status* **C**

ACCEPT.
- PICS to be scrubbed to align with revisions in clause 98 relative to clause 55 (these are some of them)

Cl **98** *SC* **98.3.1** *P* **45** *L* **46** # 55

Zimmerman, George — CME Consulting, Inc.

Comment Type **ER** *Comment Status* **A** *Editorial - references*

cross reference to clause 45 for XLGMII is incorrect

SuggestedRemedy

Should point to Clause 81 for XLGMII

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2** *P* **47** *L* **20** # 56

Zimmerman, George — CME Consulting, Inc.

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

extra "an"

SuggestedRemedy

delete "an" to rean "into two sets."

Response *Response Status* **C**

ACCEPT. (see comment 29)

Cl **98** *SC* **98.3.2.2** *P* **64** *L* **20** # 29

McClellan, Brett Marvell

Comment Type **E** *Comment Status* **A** *Editorial*

typo "and split the bits into an two sets"

SuggestedRemedy

change "and split the bits into an two sets"
to
"and split the bits into two sets"

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2** *P* **64** *L* **29** # 30

McClellan, Brett Marvell

Comment Type **E** *Comment Status* **A** *Editorial*

"symbol period, T, is 1.25 ns."
needs to be updated

SuggestedRemedy

change "symbol period, T, is 1.25 ns."
to
"symbol period, T, is 312.5 ps."

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.16** *P* **56** *L* **4** # 74

Zimmerman, George CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Editorial*

65-bit block has extra spacing

SuggestedRemedy

clean up spacing on lines 4 & 34

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.16** *P* **73** *L* **3** # 31

McClellan, Brett Marvell

Comment Type **E** *Comment Status* **A** *Editorial*

typo "The transcoder construct"
and "65- bit"

SuggestedRemedy

change to
"The transcoder constructs"
and
"65-bit"

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.17** *P* **58** *L* **3** # 75

Zimmerman, George CME Consulting, Inc.

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

typo on "concantenated"

SuggestedRemedy

replace with concatenated

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.19** *P* **75** *L* **30** # 32

McClellan, Brett Marvell

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

auxiliary bit should be randomized

SuggestedRemedy

add text:
"It is highly recommended that the auxiliary bit be randomized."

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.2** *P* **48** *L* **10** # 57

Zimmerman, George — CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *PCS*

encoding of 64/65b in 40GBASE-T (and 10GBASE-T) did not provide for clock recovery or relate to LDPC frame errors.

SuggestedRemedy

Delete sentences "The encoding defined...., and "The encoding also...", as shown in strikeout, and delete editors note.

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.20** *P* **59** *L* **32** # 114

Wu, Peter — Marvell

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

Text marked as pending approval

SuggestedRemedy

Request to accept the text with some changes in the presentation of "RS code scheme to protect "un-coded" bits at 40GBASE-T"

Response *Response Status* **C**

ACCEPT.
Approve already incorporated text, replace figure 98-9 (page51) with page 6 of presentation (wu_3bq_01_1114.pdf), and add pad-bit definition from page 10 of presentation ("The added 0000 at C4
[3:0] will be omitted. ") to draft.

Cl **98** *SC* **98.3.2.2.20** *P* **59** *L* **35** # 76

Zimmerman, George — CME Consulting, Inc.

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

extra "["

SuggestedRemedy

delete hanging "["

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.20** *P* **60** *L* **50** # 77

Zimmerman, George — CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *PCS*

Don't need extra annex, editors note has served its purpose

SuggestedRemedy

delete editors note asking question

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.20** *P* **77** *L* **36** # 33

McClellan, Brett — Marvell

Comment Type **E** *Comment Status* **A** *Editorial*

figure 98-13, there is a line covering the text "p2"

SuggestedRemedy

remove line

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.24** *P* **80** *L* **45** # 34

McClellan, Brett — Marvell

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

1.2 us should be 1.12us

SuggestedRemedy

change 1.2 to 1.12

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.4** *P* **48** *L* **49** # 58

Zimmerman, George — CME Consulting, Inc.

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

Figure 98-9 needs to be redrawn with corrections - replace references to uncoded bits with references to RS coded bits, colors need to be letter or number coded

SuggestedRemedy

Correct figure 98-9 as discussed above and delete editors note

Response *Response Status* **C**

ACCEPT. See comment 114

Cl **98** *SC* **98.3.2.2.7** *P* **53** *L* **5** # 59

Zimmerman, George — CME Consulting, Inc.

Comment Type **ER** *Comment Status* **A** *Editorial - references*

reference to 10 Gigabit Ethernet and Clause 46 should be 40 Gigabit Ethernet and Clause 81, and 81.3.4

SuggestedRemedy

Replace references as above

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.2.9** *P* **54** *L* **42** # 73

Zimmerman, George — CME Consulting, Inc.

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

Notes in Table 98-1 and column on 8B/10B are specific for 10Gbps Ethernet

SuggestedRemedy

Remove notes a & c, and replace note b with appropriate 40G reference
Delete column referring to 8B/10B code

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.2.3** *P* **64** *L* **14** # 78

Zimmerman, George — CME Consulting, Inc.

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

Only uncorrectable RS errors should cause hi_lfer

SuggestedRemedy

change "RS error" to "uncorrectable RS error"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Editor to make it clear we are referring to the RS-FEC

Cl **98** *SC* **98.3.4** *P* **66** *L* **13** # 79

Zimmerman, George — CME Consulting, Inc.

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

figure 98-15 is missing

SuggestedRemedy

Insert figure 98-15 from clause 55. (unchanged)

Response *Response Status* **C**

ACCEPT. - see comment 35

Cl **98** *SC* **98.3.4** *P* **83** *L* **13** # 35

McClellan, Brett — Marvell

Comment Type **E** *Comment Status* **A** *Editorial*

Figure 98-15 is missing/blank

SuggestedRemedy

fix the figure

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.5.3** *P* **70** *L* **20** # 128

Graba, Jim — Broadcom

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

This EEE feature, to allow a PHY to request the link partner to leave LPI mode, has not been approved by the TF.

SuggestedRemedy

Discuss and vote on the inclusion of this feature.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
- discussed with comment 36
reference graba_3bq_01_0714.pdf slides 5&6
and presentation graba_3bq_01_1114.pdf

Chair to form ad hoc to prepare text and analyze corner cases for consideration in draft 1.2 - commenters asked to resubmit comments on draft 1.1 with proposed text and state machines to define.

Cl **98** *SC* **98.3.5.3** *P* **87** *L* **20** # 36

McClellan, Brett — Marvell

Comment Type **E** *Comment Status* **A** *EEE*

the proposal lacks the details needed for a specification

SuggestedRemedy

remove until we have a full baseline or change to editorial note

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 128

Cl **98** *SC* **98.3.6.2.1** *P* **71** *L* **6** # 80

Zimmerman, George — CME Consulting, Inc.

Comment Type **TR** *Comment Status* **A** *Fast Retrain*

Cross reference is to 10G, Need to add Link Interruption ordered_set to XLGMII

SuggestedRemedy

Add Link Interruption Ordered_set to XLGMII in Clause 81 similar to 46.3.4 and change reference

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.6.2.2** *P* **71** *L* **19** # 81

Zimmerman, George — CME Consulting, Inc.

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

4x change changes bit error rate for hi_lfer_cnt, since 125usec now includes 4x the number of bits

SuggestedRemedy

Change hi_lfer definition to "exceeds 64"
alternatively, define in terms of a new term, N_sym, and make it a constant * N_sym so that for 40G it comes to 64

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Editorial license to make the reference generalizable with symbol rate.

Cl **98** *SC* **98.3.6.2.2** *P* **71** *L* **43** # 82

Zimmerman, George — CME Consulting, Inc.

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

Text refers to 32 bit XGMII words, and needs to be updated to reflect XLGMII

SuggestedRemedy

change references reflect 64 bit XLGMII word.

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.3.6.2.2** *P* **88** *L* **38** # 38

McClellan, Brett — Marvell

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

"b. CRC8 check is satisfied"
The CRC check was removed.

SuggestedRemedy

replace with
"b. the RS did not have an uncorrectable error"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
replace with
"b. the RS-FEC did not have an uncorrectable error"

Cl **98** *SC* **98.3.6.2.3** *P* **90** *L* **18** # 37

McClellan, Brett — Marvell

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

The 125 us timer should be changed to 125/4 or the effective error rate should be changed from 4E-4 to 1E-4.

SuggestedRemedy

change timer to 31us,
similarly change 125us to 31us in other locations

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 81

Cl **98** *SC* **98.3.6.2.5** *P* **92** *L* **33** # 39

McClellan, Brett — Marvell

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

line 33 and line 38
lpi_qr_time x 4
should be
lpi_qr_time x 6

SuggestedRemedy

change to lpi_qr_time x 6

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.4.2.2** *P* **85** *L* **37** # 83

Zimmerman, George — CME Consulting, Inc.

Comment Type **T** *Comment Status* **A** *Loop timing*

remove option on loop timing - make it mandatory

SuggestedRemedy

Change "may include" to "includes", replace "If loop timing is implemented and the PMA_CONFIG..." with "If the PMA_CONFIG...", delete sentence beginning with "If loop timing is not implemented..."

Response *Response Status* **C**

ACCEPT.
DISCUSS - See comments 27 & 51

Cl **98** *SC* **98.4.2.4** *P* **105** *L* **41** # 40

McClellan, Brett — Marvell

Comment Type **T** *Comment Status* **A** *PMA Receiver*

"The receiver shall correct for differential delay variations of up to 50 ns across the wire-pairs."
50ns is excessive for a 30 meter channel.

SuggestedRemedy

change to 15ns

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
- see comment 84
Needs to be consistent with 98.7.2.6
Change to 17 ns

Cl **98** *SC* **98.4.2.4** *P* **88** *L* **40** # 84

Zimmerman, George — CME Consulting, Inc.

Comment Type **TR** *Comment Status* **A** *PMA Receiver*

Receiver correction for differential delay (50ns) is still the 100m value, inconsistent with delay skew spec in 98.7.2.6 (17ns)

SuggestedRemedy

Change receiver differential delay varition spec (50ns) to be consistent with 98.7.2.6 - preferably by reference to 98.7.2.6

Response *Response Status* **C**

ACCEPT.
See comment 40

Cl **98** *SC* **98.4.2.5.14** *P* **111** *L* **39** # 41

McClellan, Brett — Marvell

Comment Type **T** *Comment Status* **A** *Startup - PBO*

"PBO=4 (corresponding to a power backoff of 8 dB). "
needs to be updated for new PBO table

SuggestedRemedy

change to TBD until the PBO is selected for initial training

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Editors note to remain, see comment 87
PHY vendors encouraged to check margins and come with specific proposed level.

Cl **98** *SC* **98.4.2.5.14** *P* **112** *L* **11** # 42

McClellan, Brett — Marvell

Comment Type **T** *Comment Status* **A** *Startup - PBO*

"the SLAVE shall request a desired PBO level that is within two levels (within 4 dB)"
4dB difference between devices is too large.
Task force should consider reducing the difference or the master selects PBO for both, or both use the smaller backoff setting.

SuggestedRemedy

both devices use the smaller backoff setting

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.4.2.5.14** *P* **112** *L* **18** # 43

McClellan, Brett Marvell

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

"10ms" and "1ms"
absolute times should to be reduced by 4 corresponding to the 4x clock rate
Task force should consider reducing initial count settings.

SuggestedRemedy

change 10ms to 2.5ms
change 1ms to 250us

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
- see comment 90

No resolution to changing the initial count settings.

Cl **98** *SC* **98.4.2.5.14** *P* **94** *L* **48** # 87

Zimmerman, George CME Consulting, Inc.

Comment Type **T** *Comment Status* **R** *Startup - PBO*

Editors note has done its job - PAM 2 Infofield margin is greater than it was for 10GBASE-T at 100m.

SuggestedRemedy

Delete editors note

Response *Response Status* **C**

REJECT.
See comment 41

Cl **98** *SC* **98.4.2.5.14** *P* **95** *L* **17** # 90

Zimmerman, George CME Consulting, Inc.

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

relation of time to transition counter is incorrect because of 4x symbol rate. Conversion to allow longer time would require rework of infofield format to allow longer transition counter

SuggestedRemedy

delete reference to time (10ms, line 17) and (1ms, line 18)
also, page 102, lines 28 & 29,

DISCUSS - this may have implications relative to prior decision on startup time.

Response *Response Status* **C**

ACCEPT.
- see comment 43

Cl **98** *SC* **98.4.2.5.14** *P* **96** *L* **34** # 91

Zimmerman, George CME Consulting, Inc.

Comment Type **T** *Comment Status* **D** *Startup*

Table 98-10 - we may want to revisit Recommended times, especially average times.

SuggestedRemedy

Propose Chair charter an ad hoc to come back with proposals before the next meeting.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **98** *SC* **98.4.2.5.15** *P* **97** *L* **3** # 85

Zimmerman, George CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Editorial*

Editors note has done its job

SuggestedRemedy

Delete editors note

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.4.2.5.7** *P* **109** *L* **53** # 46

McClellan, Brett Marvell

Comment Type **TR** *Comment Status* **R** *Startup*

"frame error ratio of less than 3.2 X 10-9"
this doesn't match other occurances of frame error ratio of 9.6 X 10-9page 134 line 2, line 28
page 135 line 14

SuggestedRemedy

change to:"frame error ratio of less than 9.6 X 10-9"
also need to change page 158 line 11

Response *Response Status* **C**

REJECT.
Frame error ratios of 3.2e-9 relate to LDPC frame error ratios at 1e-12 BER and 9.6e-9 frame error ratios relate to 800 octet Ethernet frame errors

Cl **98** *SC* **98.4.2.7** *P* **115** *L* **9** # 44

McClellan, Brett Marvell

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

"50 complete quiet-refresh cycles (nominally equal to 512 us)"
should be 8.192/4 = 2.048ms

SuggestedRemedy

change 512us to 2.048ms

Response *Response Status* **C**

ACCEPT.
Commenter advised similar error exists in Clause 55, and may consider submitting a maintenance request

---

Cl **98** *SC* **98.4.3.1** *P* **116** *L* **1** # 45

McClellan, Brett Marvell

Comment Type **T** *Comment Status* **R** *Startup - PBO*

"power backoff (up to 14 dB)"
14dB is excessive, consider change the max PBO to 6dB

SuggestedRemedy

change 14dB to 6dB

Response *Response Status* **C**

REJECT.
No savings proposed by eliminating the capability, and maintaining the capability could save power. Additionally, see zimmerman_3bq_3_0714.pdf, PBO up to 8dB can be of use managing receiver dynamic rate, and would also eliminate any need to change startup.

Cl **98** *SC* **98.4.3.1** *P* **99** *L* **14** # 89

Zimmerman, George CME Consulting, Inc.

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

reference to "scaled insertion loss equation" is incorrect. There is no longer a scaled insertion loss equation in 98.7, and the explanatory remark is not relevant.

SuggestedRemedy

Delete "and have been computed using the scaled insertion loss equation in 98.7"

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.4.3.1** *P* **99** *L* **3** # 88

Zimmerman, George CME Consulting, Inc.

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

power backoff set size is incorrect (left over from prior version)

SuggestedRemedy

Change "approximately 6 dB steps" to "approximately 2 dB steps"

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.4.5.2** *P* **104** *L* **13** # 92

Zimmerman, George CME Consulting, Inc.

Comment Type **TR** *Comment Status* **D** *EEE*

time associated with 50 complete quiet refresh signal periods is incorrect

SuggestedRemedy

Change to 512usec, or, better, define a term, N_sym (proportional # symbols/sec) so that for 40G it is 512usec.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **98** *SC* **98.4.6.3** *P* **108** *L* **24** # 93

Zimmerman, George CME Consulting, Inc.

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

References in note 2 point to 10GigT link status variables

SuggestedRemedy

replace with _40GigT variables

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.5.3.2** *P* **114** *L* **51** # 94

Zimmerman, George CME Consulting, Inc.

Comment Type **T** *Comment Status* **A** *PMA Transmitter*

Scale transmitter linearity for frequency

SuggestedRemedy

Discuss. Nominally this was related to distortion of the far-end signal and for safety should be > 33 dB (10dB better than threshold SNR) across the band to Nyquist. But, this is definitely an overkill safety margin and may be too high? (52 dB out to 200 MHz, then rolling off)

Scale frequency (25 becomes 100MHz), and put a "TBD" next to it, unless there is convergence on an alternate proposal.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Retain editors note flagging the issue

Cl **98** *SC* **98.5.3.4** *P* **116** *L* **17** # 95

Zimmerman, George CME Consulting, Inc.

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

Figure 98-39 has mirrored y-axis label, and title still says "(update)"

SuggestedRemedy

fix y-axis on FIgure 98-39 Transmit PSD, and delete the word "(update)" from title

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.5.4.1** *P* **117** *L* **1** # 96

Zimmerman, George CME Consulting, Inc.

Comment Type **TR** *Comment Status* **A** *PMA Receiver*

BER is after LDPC and RS decoding which is in the PCS this isn't mentioned

SuggestedRemedy

insert ", after LDPC and RS decoding, " between 10^-12 and "and sent to the XLGMII"

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.5.4.4** *P* **118** *L* **4** # 97

Zimmerman, George CME Consulting, Inc.

Comment Type **T** *Comment Status* **A** *PMA Receiver*

5 meters is probably not the right shortening to account for 2.5dB insertion loss at 40GBASE-T frequencies. Also, desire to be independent of both the test equipment and the transmission rate suggests the "helpful commentary" is less than helpful.

SuggestedRemedy

Delete "by approximately 5m"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Delete "This can be accomplished by…5m."

Cl **98** *SC* **98.5.4.5.1** *P* **118** *L* **21** # 98

Zimmerman, George CME Consulting, Inc.

Comment Type **T** *Comment Status* **A** *Short Reach*

TIA has defined a direct attach cord channel, reflected in the draft, unaccepted text

SuggestedRemedy

Accept the text inserted or alternate text referencing the TIA Category 8 direct attach channel. Delete the editors note.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 2

Cl **98** *SC* **98.5.4.5.1** *P* **118** *L* **28** # 115

Belopolsky, Yakov — Bel Stewart

Comment Type **TR** *Comment Status* **D** *Cabling references*

IEC/ISO TR 11801-99-01 Guidance for balanced cabling in support of at least 40 Gbit/s data transmission recognizes Classes I and II ,and correspondingly components of categories 8.1 or 8.2 can be utilized for a Short Reach Test Channel.

SuggestedRemedy

Replace "Category 8.1" with "Category I or Category II component

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

- Short reach test channel text is to be "deleted or replaced" per Ed Note: "Need to delete or replace text below with an appropriate short reach channel, ideally referencing TIA or ISO specs". See contribution diminico_3bq_01_1114.pdf for short reach test channel replacement text.

-Also, even in the existing text, ISO nomenclature is Category 8.1 or Category 8.2 for components. The nomenclature of "Class" refers to channel requirements, not the components referenced in the clause.

Cl **98** *SC* **98.5.4.5.1** *P* **135** *L* **22** # 2

DiMinico, Christopher — MC Communications

Comment Type **T** *Comment Status* **A** *Short Reach*

98.5.4.5.1 Short reach test channel text provided in contribution per Ed note to delete or replace text with an appropriate short reach channel....

SuggestedRemedy

see contribution diminico_3bq_01_1114.pdf

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
98.5.4.5.1 Short reach test channels
The short reach link segment meeting the transmission requirements in this subclause are specified to support up to 5 (TBD) meters.
98.5.4.5.1.1 Direct attach cable assembly
The direct attach cable assembly contains balanced twisted-pair terminated in a connector at each end for use as a short reach link segment between MDIs.
98. 5.4.5.1.1.x.x Direct attach cable assembly transmission requirements – (TBD)
TIA and ISO are developing direct attach channel specifications to support short reach link segments.
Editor is directed to utilize the limits in TIA Category 8 specification D 2.0E, Clause 6.4 to specify 98.xxx short reach link segment for the transmission requirements corresponding to the link segment parameters specified in 98.7.2 Link segment transmission parameters i.e., Insertion Loss, Return Loss, NEXT,MDNEXT (PSNEXT), ACRF, MDACRF (PSACRF), delay, delay skew, MDANEXT (PSANEXT), MDAFEXT (PSAACRF). The specifications will be TBD.

Cl **98** *SC* **98.6.1.1** *P* **119** *L* **8** # 99

Zimmerman, George — CME Consulting, Inc.

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

Editors note has served its purpose, accept text in section.

SuggestedRemedy

Delete editors note and accept text.

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.6.1.2** *P* **119** *L* **48** # 100

Zimmerman, George — CME Consulting, Inc.

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

Editors note has served its purpose

SuggestedRemedy

Delete editors note

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.6.2** *P* **122** *L* **2** # 101

Zimmerman, George — CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Autoneg*

Technology message code name is specific to 10G/1000BASE-T. need a new name that can apply also to 40GBASE-T. See comment on 28C.11

SuggestedRemedy

Change name to "Gigabit BASE-T Technology message code (Extended Next Page)"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comments 62 & 102

"xGBASE-T Technology message code"
(also need to change references in Clause 55.6.2 and in Clause 40)

Cl **98** *SC* **98.6.2** *P* **123** *L* **24** # 103

Zimmerman, George — CME Consulting, Inc.

Comment Type **T** *Comment Status* **A** *Loop timing*

optional loop timing - make it mandatory

SuggestedRemedy

fix references on lines 24, delete sentence beginning with "In the situation where one link partner supports..." through the sentence ending with "was not resolved."

Response *Response Status* **C**

ACCEPT.
- see comments

Cl **98** *SC* **98.6.2** *P* **123** *L* **9** # 102

Zimmerman, George — CME Consulting, Inc.

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

Editors note has served its purpose

SuggestedRemedy

Delete editors note

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.7** *P* **124** *L* **3** # 104

Zimmerman, George — CME Consulting, Inc.

Comment Type **T** *Comment Status* **R** *Cabling references*

Reference to "additional requirements specified in this subclause" is dated to 10GBASE-T running on cat 6. any link segment meeting the "requirements specified in this subclause" should work.

SuggestedRemedy

replace "Class I 4-pair balanced cabling that meets the additional requirements specified in this subclause" with "Class I or other 4-pair balanced cabling that meets the requirements specified in this subclause".

Response *Response Status* **C**

REJECT.
The basis for the link segment specification is not for all "4-pair balanced cabling"; Class I is used.
Page 141, L18 provide language to "support" other cabling that meets the requirements of 98.7.

Cl **98** *SC* **98.7** *P* **124** *L* **39** # 116

Belopolsky, Yakov — Bel Stewart

Comment Type **TR** *Comment Status* **D** *Cabling references*

40GBASE-T is intended to operate over the cabling that meets the requirements of the ISO/IEC 111801 standard that specially supports 40G, that standard includes Class I and Class II channels and, in fact, recognizes that components of category 6a and 7a or better can support such transmission . The statement that 40GBase is designed to operate over Class I cabling is incorrect

SuggestedRemedy

remove the " Class I" or replace with Class I or Class II

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

The language used in 98.7 allows for other classes to be supported if the link segment meets the requirements of 98.7. Reference to Class II is given in Table 98–18.

98.7.1 Cabling system characteristics
The cabling system used to support 40GBASE-T requires 4 pairs of ISO/IEC 11801 Class I balanced cabling with a nominal impedance of 100 ohm. Operation on other classes of cabling may be supported if the link segment meets the requirements of 98.7.

Cl **98** *SC* **98.7.1** *P* **124** *L* **2324** # 117

Belopolsky, Yakov — Bel Stewart

Comment Type **TR** *Comment Status* **D** *Cabling references*

40GBASE-T is intended to operate over the cabling that meets the requirements of the ISO/IEC 111801 standard that specially supports 40G, that standard include Class I and Class II channels and in fact recognizes that components of categories 6a and 7a or better can support such transmission . The statement t that 40GBase is designed to operate over Class I cabling is incorrect

SuggestedRemedy

remove the " Class I" or replace with "at least Class I"

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

See response to comment#104 and comment#117

Cl **98** *SC* **98.7.1** *P* **124** *L* **24** # 105

Zimmerman, George — CME Consulting, Inc.

Comment Type **T** *Comment Status* **D**

"additional requirements" relative to class I? I don't think we have any

SuggestedRemedy

delete "additional" - scrub document for other instances

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

See
98.7.2.2 Differential characteristic impedance.
In addition, like to keep the "additional" untill we reach closure on link segment specifications.

Cl **98** *SC* **98.7.2** *P* **124** *L* **28** # 129

Cibula, Peter — Intel Corporation

Comment Type **T** *Comment Status* **D**

Consider whether Subclause 98.7.2 should include link segment transmission parameters appropriate for shielded cabling system characteristics.

SuggestedRemedy

Discuss adding coupling attenuation and/or other characteristics as a transmission parameter(s) for shielded link segments.

Clause 98.7 states that 40GBASE-T is designed to operate over ISO/IEC 11801 Class I 4-pair balanced cabling, and defines a link segment based upon copper media specified by ISO/IEC JTC1/SC25/WG3 and TIA TR42.7. The corresponding draft specifications, PN-568-C.2-1, Draft 2.0c (to be published as ANSI/TIA-568-C.2-1) and ISO/IEC JTC 1/SC 25 DTR 11801-99-1 both include transmission requirements related to shielded implementations. The 40GBASE-T link segment should reflect those requirements and, of course, identify them as applying to shielded link segments.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Coupling attenuation measurements (laboratory) are used to characterize cabling electromagnetic immunity and not directly related to transmission parameters (i.e., the link segment transmission parameters) and transmission performance (SNR). The link segment alien crosstalk specifications indirectly characterizes cabling electromagnetic immunity as well as providing basis for transmission performance (SNR). In addition, 802.3bq references both ISO/IEC Class I and TIA Category 8 in which cabling characteristics related to the shielding performance are specified as well as other specifications not directly related to system performance (SNR). 802.3bq does not specify to characterize the link segment transmission performance.

Cl **98** *SC* **98.7.2** *P* **124** *L* **3042** # 118

Belopolsky, Yakov — Bel Stewart

Comment Type **TR** *Comment Status* **D** *Cabling references*

40GBASE-T is intended to operate over the cabling that meets the requirements of the ISO/IEC 111801 standard that specially supports 40G, that standard include Class I and Class II channels and in fact recognizes that components of categories 6a and 7a or better can support such transmission . The statement t that 40GBase is designed to operate over Class I cabling is incorrect
Table 98.18 is incorrect

SuggestedRemedy

line 30 remove the " Class I" or replace with "at least Class I'
Line 42 Table 98.18 remove Category 8 replace with ISO/IEC Classes I or II

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

See response to comment#104 and comment#117

Cl **98** *SC* **98.7.2.1** *P* **124** *L* **48** # 12

Larsen, Wayne — CommScope

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

The IEEE IL formula can be more onerous than the ISO forumula by up to 0.01 dB in the frequency range of about 1-50 MHz. Not sure anything needs to be done about this.

SuggestedRemedy

Response *Response Status* **C**

REJECT. Commenter has not characterized problem to address or suggested remedy.

Cl **98** *SC* **98.7.2.3** *P* **125** *L* **21** # 86

Zimmerman, George — CME Consulting, Inc.

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

Equation 98-14 says "log" without showing it is a base-10 logarithm

SuggestedRemedy

Change "log f" to "log_10 f" in equation 98-14 consistent with IEEE style

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.7.2.3** *P* **125** *L* **21** # 14

Larsen, Wayne CommScope

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

Combine lines 4 and 5 of equation 98-14 into one line.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.
See response comment#1

Cl **98** *SC* **98.7.2.3** *P* **142** *L* **25** # 1

DiMinico, Christopher MC Communications

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

EQ 98-14 redundant frequency range

SuggestedRemedy

delete line in brackets {8 1600<f</=2000}
change {8 1600<f</=2000} to {8 1000<f</=2000}

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.7.2.4.1** *P* **125** *L* **45** # 13

Larsen, Wayne CommScope

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

We should fill in something to replace the TBD for (pair-to-pair) NEXT. The equations should be chosen to support both the TIA and ISO equations.

SuggestedRemedy

Use the TIA equation for 1-1486 MHz, and the ISO equation from 1486-2000 MHz. These equations will be provided in a contribution (They are also available from the drafts).

Response *Response Status* **C**

ACCEPT.
See larsen_3bq_01_1114.pdf for equation

Cl **98** *SC* **98.7.2.4.1** *P* **125** *L* **46** # 106

Zimmerman, George CME Consulting, Inc.

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

pair-to-pair NEXT loss is unspecified (equation 98-15)

SuggestedRemedy

Specify pair-to-pair next loss consistent with MDNEXT loss in 98.7.2.4.2

Response *Response Status* **C**

ACCEPT.
See comment#13

Cl **98** *SC* **98.7.2.4.2** *P* **126** *L* **1** # 16

Larsen, Wayne CommScope

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

There is no reason to have both terms "MDNEXT" and "PSNEXT". The text as it is written does not explicitly say that those are the same. Clause .2, titled MDNEXT, seems to give the requriement, and clause .3, titled PSNEXT, seems to give an explanation of how to calculate it from measured data. Other SDOs use the term "PSNEXT" but they do not use the term "MDNEXT".

SuggestedRemedy

Change the title of 98.7.2.4.2 to "Mulitple disturber power-sum near-end crosstalk (PSNEXT) loss (same as the present title of .3). Delete the present clause heading of 98.7.2.4.3, so that the material therein becosmes part of .2. Renumber sub-sequent clauses.

Response *Response Status* **C**

REJECT.
The use of multiple disturber crosstalk used here is consistent BASE-T and twinaxial PHYs (802.3ba, 802.3bj). Multiple disturber is related to the signalling topology (e.g., number of pairs) and provides the basis for understanding the need to combine crosstalk between duplex channels provided in the text.
Text is explicit:
"To ensure the total NEXT coupled into a duplex channel is limited, multiple disturber NEXT loss is specified as the power sum of individual NEXT losses."

Power summation is a calculation used here and in other SDO's to sum the individual NEXT losses also given in the text.

Cl **98** *SC* **98.7.2.4.2** *P* **126** *L* **14** # 107

Zimmerman, George — CME Consulting, Inc.

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

equations 98-16, 98-17, 98-18 say "lg" rather than "log"

SuggestedRemedy

change equation to read "log_10" consistent with IEEE style

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.7.2.4.2** *P* **126** *L* **33** # 15

Larsen, Wayne — CommScope

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

The IEEE PSNEXT (MDNEXT) requirement is more onerous than the ISO spec by up to 0.02 dB in the frequency range from 1078 MHz to 1100 MHz. Not sure how serious this is, but a remedy is proposed that will overcome it.

SuggestedRemedy

Change the value 1100 to 1078 in two places. Lines 33 and 45.

Response *Response Status* **C**

REJECT. Motion to approve equations refers to zimmerman_3bq_03a_0914.pdf illustrating differences and noting negligible effect. Motion #6: Move that 802.3bq accept the equations for PSNEXT and PSACRF on slides 5 & 6 of zimmerman_3bq_03a_0914.pdf as baseline text for the link segment PSNEXT and PSACRF requirements, with editorial license to make the equations consistent with 802.3 draft
M: George Zimmerman S: Chris Diminico
Technical (> 75%)
Y: 18 N: 1 A: 3
MOTION PASSES
Commenter has not provided additional information pointing out a problem.

Cl **98** *SC* **98.7.2.4.4** *P* **127** *L* **47** # 17

Larsen, Wayne — CommScope

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

We need to fill in something for the TBD for ACRF. The TIA is more onerous than the ISO by 0.008 dB at aevery frequency point, based on my calculations. Doesn't make much difference, but suggest using the TIA equation for this reason.

SuggestedRemedy

replace the TBD on line 47 with the TIA ACRF requirement. It will be provided in a contribution or can be obtained from the draft.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Editor to verify that TIA ACRF specification is in fact more onerous than ISO by a small amount.

Cl **98** *SC* **98.7.2.4.5** *P* **128** *L* **14** # 19

Larsen, Wayne — CommScope

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

There is no reason to have both terms "MDACRF" and "PSACRF". The text as it is written does not explicitly say that those are the same. Clause .5, titled MDACRF, seems to give the requriement, and clause .6, titled PS ACRF, seems to give an explanation of how to calculate it from measured data. Other SDOs use the term "PSARCF" but they do not use the term "MDACRF".

SuggestedRemedy

Change the title of 98.7.2.4.5 to "Mulitple disturber power-sum equal level far-end crosstalk (PSACRF) loss (same as the present title of .6). Delete the present clause heading of 98.7.2.4.6, so that the material therein becosmes part of .2. Renumber sub-sequent clauses.

Response *Response Status* **C**

REJECT.
See response comment #16

Cl **98** *SC* **98.7.2.4.5** *P* **128** *L* **23** # 18

Larsen, Wayne — CommScope

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

The equaiton used was the pair-to-pair ACRF equaiton, not the power sum, in error.

SuggestedRemedy

In equation 98-24, change 39 to 36, and change 43.1 to 40.1.

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.7.2.5** *P* **128** *L* **53** # 20

Larsen, Wayne CommScope

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

The cabling channel will comply with 176 ns at 2000 MHz, but it has an increasing delay as the frequency becomes lower. We need to use an equation. Also, the requriement needs to apply starting at 1 MHz, not starting at 2.

Alternatively, we could specify less than 187 ns at all f from 1-2000 MHz or less than 179 ns from 10-2000 ns.

SuggestedRemedy

Use the TIA equation for this. It will be provided in a contribution or can be obtained from the draft.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Link segment delay starting frequency of 2MHz is consistent with BASE-T PHYs.

Change: The propagation delay of a link segment shall not exceed 176 ns at all frequencies between 2 MHz and 2000 MHz.

To: The propagation delay of a link segment shall not exceed 185 ns at all frequencies between 2 MHz and 2000 MHz

Add editor's note - The delay is reconciled to TIA Category 8 delay at 2 MHz, PHY vendors are encouraged to consider what the lowest frequency they care about delay is (and what the delay is there according to cabling specifications) and submit comments.

Cl **98** *SC* **98.7.2.6** *P* **129** *L* **4** # 3

Larsen, Wayne CommScope

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

The range should be from 1-2000 MHz, not 2-500 MHz.

SuggestedRemedy

Change the range to 1 MHz to 2000 MHz.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Link segment delay starting frequency 2 MHz consistent with BASE-T PHYs.
Change: 2 MHz to 500 MHz
to: 2 MHz to 2000 MHz

Cl **98** *SC* **98.8.1** *P* **131** *L* **38** # 4

Larsen, Wayne CommScope

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

The specification of the MDI was not updated correctly based on motion 7 from the September meeting.

SuggestedRemedy

Change from

IEC 60603-7-4 (unscreened) or IEC 60603.7-5 (screened)

change to

IEC 60603-7-51 (published) with the improved characteristics and frequency extenstions sepcified in 60603-7-81 (currently CDV draft)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 119

Cl **98** *SC* **98.8.1** *P* **131** *L* **39** # 108

Zimmerman, George CME Consulting, Inc.

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

section does not implement resolution of motion 12 at September interim: "Move that 802.3bq include the RJ-45 as reflected in IEC 60603-7-51 (published) with the improved characteristics and frequency extensions specified in 60603-7-81 (currently CDV draft) as an MDI interface"

(apologies of the editor - I made this edit and it must have gotten lost in a crash...)

SuggestedRemedy

Replace first sentence ("Eight pin...") with: "Eight-pin connectors meeting the requirements of IEC 60603-7-51 with improved characterstics and frequency extensions specified in IEC 60603-7-81 (currently in CDV draft) shall be used as the mechanical interface to the balanced cabling.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
- see comment 119

Cl **98** *SC* **98.8.1** *P* **131,132** *L* # 119

Belopolsky, Yakov — Bel Stewart

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

40GBASE-T is intended to operate over the cabling that meets the requirements of the ISO/IEC 111801 standard that specially supports 40G, that standard include Class I and Class II channels and in fact recognizes that components of categories 6a and 7a or better can support such transmission .
The reference to IEC 60603-7-4 (unscreened) and IEC 606-7-5 (screened) is not correct
The use of unscreened connectors in the 2000MHz transmission is not supported by technical evidence known to the commenter.
The informational pictures 98-41 and 98-42 are misleading. The information on the recognized connectors is contained in the IEC/ISO TR 11801-99-01

(An animal with four legs is not always a horse)

SuggestedRemedy

remove pictures 98-41 and 98-42
Line 39 remove " IEC 60603-7-4 (unscreened) and IEC 606-7-5 (screened)" replace with "connectors recognized by IEC/ISO TR 11801-99-01"
preferred text : "connectors categories 8.1 or 8.2 recognized by IEC/ISO 11801

Line 41 remove the sentence starting with "These connectors are depicted...

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve with comment 4, 108

In accordance with Motion#12 during 40GBASE-T Task Force
September 9-10, 2014. Revise 98.8.1 to include IEC references.

From: Eight-pin connectors meeting the requirements of IEC 60603-7-4 (unscreened) or IEC 60603-7-5 (screened) shall be used as the mechanical interface to the balanced cabling.
To: Eight-pin connectors meeting the requirements of IEC 60603-7-51 (published) with the improved characteristics and frequency extensions specified in IEC 60603-7-81 shall be used as the mechanical interface to the balanced cabling.
Update figures if necessary to represent the referenced connectors.

Add Editor's Note below text: At the September 2014 meeting, the following motion was adopted, resulting in the text above: "Move that 802.3bq include the RJ-45 as reflected in IEC 60603-7-51 (published) with the improved characteristics and frequency extensions specified in 60603-7-81 (currently in CDV draft) as an MDI interface"

Cl **98** *SC* **98.8.2.1** *P* **132** *L* **46** # 5

Larsen, Wayne — CommScope

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

The requriements need to be extended to 2000 MHz. The 6 dB level as a flat plateau might be fine.

This editor's note would be accurte, if it applies to the connector by itself, free of magnitics and PCB mounting. This product is normally produced as an integrated module containing the conntor and the magnetic isolation coils. For this assembly, the return loss values in equation 98-31 are about right.

SuggestedRemedy

Delete the editor's note.

Add a new line, speciufying RL of 6 dB, flat plateau, from 500 MHz to 2000 MHz.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Delete the editor's note.

Replace the last line, starting at 400MHz and extend to 2000 MHz: specifying RL of 6 dB, flat plateau, from 400 MHz to 2000 MHz.

Cl **98** *SC* **98.8.2.2** *P* **133** *L* **15** # 11

Larsen, Wayne — CommScope

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

To extend the MDI impedance balance requriement to 2000 MHz.

It seems this change was supposed to be implimented in the last cycle but was not implimented for some reason.

SuggestedRemedy

Change 500 to 2000 in equation 98-32.

Response *Response Status* **C**

ACCEPT.

Cl **98** *SC* **98.8.2.2** *P* **134** *L* **1** # 6

Larsen, Wayne CommScope

Comment Type **T** *Comment Status* **R** *MDI*

The test procedures on this page can be improved.

Specific comments on how to improve them have been provided in the past.

SuggestedRemedy

Response *Response Status* **C**

REJECT.
Commenter has not provided sufficient information to implement changes in draft.

Cl **98** *SC* **98.8.2.3** *P* **134** *L* **45** # 7

Larsen, Wayne CommScope

Comment Type **T** *Comment Status* **R** *MDI*

Thinking this is intended to prevent damage to the PHY itself and other electronic elements, not so much the MDI.

Since it is not really an MDI requriement, consider moving it to another place in the standard. The editor's note on line 53 alludes to this.

SuggestedRemedy

from:
each wire pair of the MDI shall, under all operation conditions, withstand without damage the application of short circuits of any wire to any other wire within the connected 4-pair cable
to:
The electronic equipment containing a 40GBASE-T PHY shall, under all operation conditions, withstand without damage the application of short circuits of any wire to any other wire within the connected 4-pair cable

Response *Response Status* **C**

REJECT.
- Editor's note referred to the second paragraph ("A 40GBASE-T PHY…") Proposed resolution refers to the requirement on the MDI in the first paragraph of the subclause

See also comments 8 & 109

Cl **98** *SC* **98.8.2.3** *P* **134** *L* **50** # 109

Zimmerman, George CME Consulting, Inc.

Comment Type **E** *Comment Status* **D** *MDI*

The requirement "A 40GBASE-T PHY shall be able to sustain" relates to the PHY not just the MDI - as such it is misplaced.

SuggestedRemedy

Move lines 50 - 54 on page 134 and 1-3 on page 135 to 98.5.1 Isolation requirements, or, optionally, add a new clause after 98.5.1 to speak to this requirement.
delete editors note

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

DISCUSS - see also comments 7 & 8

Cl **98** *SC* **98.8.2.3** *P* **135** *L* **1** # 8

Larsen, Wayne CommScope

Comment Type **T** *Comment Status* **R** *MDI*

Agree with the editor's note at the end of page 134. The wording of this sentence can be improved, and a suggestion is made below. Also agree this requirement should be moved to the isolation section.

SuggestedRemedy

From:
each wire pair shall withstand without damage a 1000 V common-mode impulse of either polarity.
To:
The electronic equipment containing a 40GBASE-T PHY shall withstand without damage a 1000 V common-mode impulse applied to any wire pair, of either polarity.

Response *Response Status* **C**

REJECT.
- see comment 109
See also comment 7
Editor's note refers to preceding paragraph on lines 50-52, page 134, not subsequent paragraph.

Cl **99** *SC* *P* *L* **28** # 120

Lusted, Kent — Intel

Comment Type **E** *Comment Status* **A** *Editorial*

IEEE Std 802.3bj-2014 now exists. Add a reference

SuggestedRemedy

Add 802.3bj and the relevent supporting text.

Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* *L* **3** # 113

Zimmerman, George — CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Editorial*

Amendment should be : bq, not X

SuggestedRemedy

Substitute in at appropriate phase of editing

Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* **2** *L* **1** # 112

Zimmerman, George — CME Consulting, Inc.

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

Table of Contents is a placeholder

SuggestedRemedy

Fix production of book so Table of Contents is generated correctly

Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* **3** *L* **36** # 110

Zimmerman, George — CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Editorial*

Draft needs to add letters of amendment. (802.3bq)

SuggestedRemedy

Substitute 802.3bq for 802.3xx (global)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Substitution will happen at appropriate phase of editing.

Cl **99** *SC* *P* **4** *L* **26** # 111

Zimmerman, George — CME Consulting, Inc.

Comment Type **E** *Comment Status* **A** *Editorial*

List of amendments appears incomplete, 802.3bj, possibly others missing

SuggestedRemedy

Check amendments listed and include all relevant ones

Response *Response Status* **C**

ACCEPT. - see comment 120