

P802.3z Draft 3.0 Comments

Comment ID	77	Topic	
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Co.	UNH InterOperability Lab		
CI	39	SC	39.2.1
		P	39.1
		L	48
Comment Type	T	Comment Status	A
The relationship between tx_bit and output voltage should be defined to guarantee interoperability.			
SuggestedRemedy			
Add statement to 39.2.1, "The higher output voltage shall correspond to tx_bit=3DONE." Add corresponding item to PICS (39.7.4.1).			
Proposed Response		Response Status	W
Accept with modification: "The higher output voltage of T+ - T= (differential voltage) shall...."			

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CI	39	SC	39.2.2
		P	39.2
		L	03
Comment Type	T	Comment Status	A
The relationship between input voltage and rx_bit should be defined to guarantee interoperability.			
SuggestedRemedy			
Add statement to 39.2.2, "The higher input voltage shall correspond to rx_bit=3DONE." Add corresponding item to PICS (39.7.4.1).			
Proposed Response		Response Status	W
Accept with modification: "The higher output voltage of R+ - R= (differential voltage) shall...."			

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CI	39	SC	39.2.3.1
		P	39.2
		L	21
Comment Type	T	Comment Status	A
Even though signal detect is optional, its behavior should be more tightly specified for cases when it is implemented. The PICS only mandate that SIGNAL_DETECT=3DFAIL when the link is unplugged or the remote transmitter is turned off. However, the PICS do no prevent an implementation from setting SIGNAL_DETECT=3DFAIL when the signal is at the limits of the receive sensitivity. This is because the commentary on margins contains no "shalls". If "shalls" were added, they would be meaningless unless attached to quantitative values.			
SuggestedRemedy			
Specify signal detect assertion and deassertion thresholds in the form of a "shall" statement with quantitative values. Propose that the "shall assert" level be the minimum receiver sensitivity (400mv), and the "shall deassert" level be 200mV . These parameters should be added to tables 39-1 and 39-3.			
Proposed Response		Response Status	W
Reject: It is the intent of the committee to allow a broad range of implementations. Specific assert levels could unduly restrict specific implementations.			

Proposed Response		Response Status	W
Reject: It is the intent of the committee to allow a broad range of implementations. Specific assert levels could unduly restrict specific implementations.			

P802.3z Draft 3.0 Comments

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CI 39 **SC** 39.3.1 **P** 39.3 **L** 38

Comment Type T **Comment Status** A

Clock tolerance specification seems to be missing.

SuggestedRemedy

Add entry to table, "clock tolerance, +/- 100 ppm".

Proposed Response **Response Status** W

Accept

Comment ID 131 **Topic**

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CI 39 **SC** 39.3.3; Tabl **P** 39.7 **L** 22 to 40

Comment Type T **Comment Status** A

The jitter numbers in Table 39.4 are not mathematically correct.

SuggestedRemedy

The following were calculated by Colin Whitby-Stevens according to the following algorithm:

- 1) FC UI * 941 -> FC ps
- 2) FC ps -> GE ps
- 3) GE ps / 800 -> GE UI

Corrected jitter table:

	Total Jitter		Deterministic Jitter		Random Jitter	
	ps	UI	ps	UI	ps	UI
TP1	188	0.24	94	0.12	94	0.12
1 to 2	82	0.1	19	0.02	63	0.08
TP2	226	0.28	113	0.14	113	0.14
2 to 3	380	0.48	207	0.26	173	0.22
TP3	527	0.66	320	0.40	207	0.26
3 to 4	38	0.05	38	0.05	0	0.0
TP4	565	0.71	358	0.45	207	0.26

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Proposed Response **Response Status** W

Reject: The numbers are still incorrect. The following numbers will be used.

	Total Jitter		Deterministic Jitter		Random Jitter	
	ps	UI	ps	UI	ps	UI
TP1	192	0.24	96	0.12	96	0.12
1 to 2	72	0.09	16	0.02	56	0.07
TP2	223	0.28	112	0.14	111	0.14
2 to 3	384	0.48	208	0.26	176	0.22
TP3	528	0.66	320	0.40	208	0.26
3 to 4	40	0.05	40	0.05	0	0.0
TP4	568	0.71	360	0.45	208	0.26

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CI 39 **SC** 39.3.4 **P** 39.7 to 3 **L** 44

Comment Type T **Comment Status** A

Subclause 39.3.4 contains redundant information.

SuggestedRemedy

1. Remove table 39-5 and associated text
2. Move all remaining text to 39.6.

Proposed Response **Response Status** W

Accept

Comment ID 184 **Topic**

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CI 39 **SC** 39.4 **P** 39.8 **L** 31

Comment Type T **Comment Status** A

There is no test description for how to test the NEXT parameter in Table 39-6.

SuggestedRemedy

Add the following test setup to the new test procedure clause.

Near End Cross Talk (NEXT) is tested using a differential TDR or equivalent filtered to the risetime (near end cross talk at 85 ps T sub r max) limit in= table 39-

6. The T+ and T- inputs of the pair are excited while the R+ and R- are measured within the same connector pair. The far end of the T+/T- pair is=

terminated per figure 39-2. The R+ and R- signals at the pair being tested= are terminated with a load (including test equipment) equivalent to that shown= in

Figure 39-2. The far end of the R+ and R- pair being monitored are unterminated.

Proposed Response **Response Status** W

Accept with editorial modifications

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CI 39 **SC** 39.4 **P** 39.8 **L** 16

Comment Type T **Comment Status** A

Requirement needed to ensure cable shield connected to connector (plug) shell.

SuggestedRemedy

Add a sub-clause that says something like "The cable shield shall be connected the shell of the connectors (plugs) at each end of the jumper cable". An item must also be added to the PICS proforma.

Proposed Response **Response Status** W

Reject: This requirement is already covered by the 11801 reference in 39.6.

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CI 39 **SC** 39.4.1 **P** 39.9 **L** 11

Comment Type T **Comment Status** A

Regarding the optional equalizer network, the statement that "It shall be used to correct for frequency selective attenuation..." is not testable.

SuggestedRemedy

Change statement to, "The output of the cable assembly, with optional equalizer network, when driven with by a transmitter meeting the requirements of 39.3.1, shall meet the eye diagram requirements of figure 39-5." Also need to change the PICS item LI-6 in 39.7.4.3.

Proposed Response **Response Status** W

Partial Accept: The sentence under question is redundant with other portions of clause 39.
Remove "It shall be used... signal components."

Type: TR/technical required T/technical E/editorial
 Comment: X/received D/dispatched for consideration A/accepted R/rejected
 Response: O/open W/written S/sent to commentor for review C/closed U/unsatisfied Z/withdrawn

Comment ID 185 **Topic**

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CI 39 **SC** New 39.3.1 **P** 39.4 **L** <tilde>19

Comment Type T **Comment Status** A

Clause 39 eye diagram does not exclude jitter and rise/fall specifications= per Ft.
Lauderdale mtg.

SuggestedRemedy

" the transmit mask is not used for response time and jitter specification."

Proposed Response **Response Status** W

Accept

P802.3z Draft 3.0 Comments

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		P	TBD
		L	*
Comment Type	T	Comment Status	A

During the Ft. Lauderdale Mtg. it was identified that clause 39 needed a subclause on test methodologies. Ed Grivna worked up a recommendation which was published on the reflector on Fri, 27 Jun 1997 10:29:05 -0500

Suggested Remedy

Test/Measurements for Clause 39

Note: My notes regarding Ed's proposal are [bracketed].

[Note: should we be specifying the minimum number of samples in some of these tests?]

[Note: should we be specify the exact pattern to be used for the tests?]

[Note: some BER tests are referenced to the CRU which is not part of the PMD; e.g. Receiver reference clock offset range]

[Note: necessary to calibrate for scope skew?]

[Add the following text to 39.3, page 39.2 after 1st paragraph. "PMD specifications shall be measured using measurement techniques defined in 39.TBD." This will result in mandatory updates to the performa table(s). Does this cover all the necessary "shalls?"]

Total Jitter [text removed from recommendation; reference to Clause 38 already exists in 39.3.3; page 39.7; line 15-16.]

Transmit Rise Time

 Rise time is a differential measurement across the TX+ and TX- outputs with a load present (including test equipment) equivalent to that shown in Figure 39-3. Both rising and falling edges [should -> are] be measured. The 100% and 0% = levels are the normalized 1 and 0 levels present when sending an alternating K28.5 (at a minimum) or other psuedorandom data pattern containing both the maximum and minimum 8B/10B coding run lengths.

Once the normalized amplitude is determined, the data pattern [should be -> is] changed to a continuous D21.5 character stream. The rise time specification is the time interval between the 20% and 80% amplitude levels between the normalized 1 and 0 amplitude levels.

Transmit Differential Skew

 The transmitter differential skew measurement is made across the TX+ and TX- outputs with a load present (including test equipment) equivalent to that shown in Figure 39-3. This consists of two single-ended measurements, and is the absolute value of the maximum time difference, at the 50% normalized amplitude point, of the TX+ signal relative to the TX- signal.

The single-ended normalized amplitudes are first determined for both the TX+ and TX- signals. The 100% and 0% levels are the normalized 1 and 0 levels present when sending an alternating K28.5 (at a minimum) or other psuedorandom data pattern containing both the maximum and minimum 8B/10B coding run lengths.

A character boundary or other stable trigger point must be available to allow the actual time skew to be measured. The measured number is the worst case across all ten bit positions, for both rising and falling edges.

[Note: this test method measures the worst case deterministic skew; does everyone agree with this? What is the relationship between deterministic skew

and deterministic jitter?]]

Transmit Eye - Normalized

This test is made as a differential measurement at the bulkhead connector. =
The scope trigger must either be a recovered clock or a from the character clock=

internal to the equipment. The data pattern for this is the CRPAT [?] or=
other pattern that insures transitions in all possible bit boundaries; i.e., an=
alternating k28.5 is n

Proposed Response **Response Status** C
accept

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	Co.	Berg		
CI	39	SC	P	L
	Comment Type	E	Comment Status	A
	Definitions and references are missing in clause.			

Suggested Remedy

To accept Ed Grivna's set of definitions and references which follow:

Glossary

1. Jumper Cable Assembly -
An electrical or optical assembly, used for the bi-directional transmission and reception of information, consisting a pair of transmission lines terminated at their ends with plug connectors. This assembly may or may not contain additional components, located between the plug connectors, to perform equalization.
2. ppd - peak-to-peak differential
3. skew - The difference in time between two signals
4. differential skew - The difference in time, between the same relative instants, of the true and complement components of a differential signal.
5. normalized amplitude - The amplitude of a signal when driving its steady state value; i.e., not under the influence of ringing or other dynamic influences.
6. differential -
 1. A mode of signal transmission where a signal and its complement are driven down a balanced transmission line with the signal carried as a single electromagnetic field located between the two conductors of the transmission line.
 2. A method of measurement which compares signals to each other rather than to a fixed reference.
7. TDR - Time Domain Reflectometer
8. Differential Sensitivity - That ppd amplitude necessary for a differential receiver to resolve both a logic-0 and a logic-1.

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9. Exception Window - A time interval during which the impedance of a mated connector and associated transmission line is allowed to exceed the impedance tolerance specification for signals passed through a connector.

10. Equalizer - A group of one or more active or passive components whose function is to correct for the frequency selective attenuation caused by skin effect, and timing variations in a signal caused by the differences in propagation time caused by variations in the propagation rate of the various spectral components present in a signal

References

ANSI X3.230-1994 Fibre Channel Physical

ISO/IEC 11801: 1995 Commercial and building wiring standard

IEC 1196-1 Cable test criteria

IEC 807-3 Connector requirements for polarized rectangular connectors for use below 3-MHz

ANSI/EIA/TIA 607 Commercial Building Grounding/Bonding requirements

IEC 61076-3-103 Style-2 Connector Requirements

Proposed Response **Response Status** C

Accept
NOTE: Direct editor to compile references

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CI	39	SC	39.1	P 39.1 L 31
	Comment Type	E		Comment Status A
	Change `0 to 25'.			
	SuggestedRemedy			
	Change `0 to 25' to `1 to 25' since some minimum length of jumper cable is required to connect same sex PHY= connectors.			
	Proposed Response		Response Status	W
	Accept but with 0.1 to 25 meters instead of 0 to 25 meters.			

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CI	39	SC	39.3.1	P 39.3 L 41
	Comment Type	E		Comment Status A
	There seems to be a conflict between the jitter specifications of table 39-1 and 39-4. I assume 39-4 to be the real specification.			
	SuggestedRemedy			
	Remove DJ, RJ, and TJ entries from table 39-1.			
	Proposed Response		Response Status	W
	Accept			

P802.3z Draft 3.0 Comments

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CI 39 **SC** 39.3.1 **P** 39.3 **L** 31

Comment Type E **Comment Status** A

Location of `point-b`?

SuggestedRemedy

I assume `point-b` is TP1. If so, suggest appropriate change be made.

Proposed Response **Response Status** W

Accept

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CI 39 **SC** 39.3.2 **P** 39.6 **L** 04

Comment Type E **Comment Status** A

The table completely specifies the receiver input impedance at TP3, the statement that "The receiver shall terminate the link by..." seems to be redundant.

SuggestedRemedy

Delete "The receiver shall terminate the link by..."

Proposed Response **Response Status** W

Accept

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CI 39 **SC** 39.3.4 **P** 39.7 **L** 49

Comment Type E **Comment Status** A

Table 39-5 seems to be redundant with tables 39-1 and 39-3.

SuggestedRemedy

Remove table 39-5 and above statement that "The systems shall meet the operational requirements...". Remove corresponding PICS item.

Proposed Response **Response Status** W

Accept

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CI 39 **SC** 39.3.4 **P** 39.8 **L** 6

Comment Type E **Comment Status** A

Recommend the sentence be re-written clarify grounds.

SuggestedRemedy

Suggested change: The jumper cable shield shall be connected to chassis ground of the MDI connector at both ends of the jumper cable as shown in Figure 39-1. For this connection to effective frame ground of the 1000BASE-X equipment must be earthed (connected to the power system ground. (Note to editor: Check to ensure there is a requirement someplace else in the 1000BASE-X spec that requires the connection of frame ground to power ground)

Proposed Response **Response Status** W

Reject: This suggestion is redundant with existing text in 39.1 and 39.6. Other: Remove the redundant "shall" in 39.1 (p 39.1; line 35).

P802.3z Draft 3.0 Comments

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CI 39 **SC** 39.4 **P** 39.8 **L** 41

Comment Type E **Comment Status** A

"The link termination shall match that shown in figure 39-2." seems be redundant with table 39-6.

SuggestedRemedy

Suggest removing that statement and the corresponding PICS item.

Proposed Response

Response Status W

Accept

Comment ID 187 **Topic**
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CI 39 **SC** 39.4 **P** 39.5 **L** 47-49

Comment Type E **Comment Status** A

Eye diagram in Figure 39-4 will be closed by high frequency jitter past the= X1 point if the maximum allowed by Table 39.4 is present.

SuggestedRemedy

Remove note in lines 47-49, indicating the high frequency jitter is present.

Proposed Response

Response Status W

Reject - Fix table 39.2 to match new Table 39.4. Change note on page 39.5,= line 47 "baud rate div. by 2500" to "637 kHz".

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CI 39 **SC** 39.4 **P** 39.8 **L** 22

Comment Type E **Comment Status** R

Table 39-6 is a reasonable summary table for the jumper cable characteristics. What is missing is the requirements/description for each individual parameter. I believe this extremely important since the specification for most of the parameters is in the time domain vs the frequency domain.

SuggestedRemedy

Provide a sub-clause for each of the jumper cable specifications.

1) Attenuation: This specification should contain frequencies higher than 625 MHz since this additional bandwidth is needed to reliably decode the NRZ signals; probably at high as 800-850 MHz. The frequency=

response

of the jumper cable is needed in order to design the imbedded equalizers as specified in 39.4.1.

2) Differential skew: A description of this parameter and why it is needed should be provided.

3) Near-End Crosstalk (NEXT) loss: If the attenuation is specified in dB, then I believe the NEXT loss should be specified in dB. If not then a description of the the time domain measurement procedure should be=

provided.

4) End to End delay: Suggest this be specified in ps rather than bit times, or both, to ensure the reader understands the parameter.

5) Link Impedance @ T2: There are two specifications provided. An exclamation is needed to define each. It appears one is for cable only, and if this the case why?

I believe the additional specificity for each of the jumper cable parameters is necessary for those who will be responsible for writing the Conformance Specification. In addition, it is also keeping with the practice used other 802.3 specifications for the media links; detailed specification to ensure the media link will support the objective BER.

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Proposed Response **Response Status** W

Partial acceptance.

1. Rejected: specification of attenuation characteristics > the= half-baud frequency are not necessary. Two signals, one with high frequency components and the other without, can not be distinguished at the output of a worst case cable. This can be shown with a Mathcad filtered model of the signal spectral components. It is outside the scope of the standard to= specify equalizer parameters.

- 2. Accept: the PMD group will define skew in the glossary. The group will also add a test procedure for skew.
- 3. Reject/Accept: NEXT measurements provide a ratio which is readily converted to dB.

b) put it in the measurement subclause.

4. Reject: The selection of bit times was done to conform with the "bit-budget" specifications present in the other major clauses of the standard. It was deemed unnecessary to provide both units.

5. The reason for the two is because the impedance through the connectors cannot be as well controlled as it can through the cable. The usage of these parameters are explained in the new test requirements section.

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CI	39	SC	39.4	P	39.8	L	18
Comment Type	E	Comment Status	A				

Wordsmith `male'

SuggestedRemedy

Suggest `male' be changed to `plug (male)'.

Proposed Response **Response Status** W

Accept. Scrub entire document for "male" and "female." Change "male" to plug= and "female" to receptacle.

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CI	39	SC	39.4	P	39.9	L	5
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Comment Type	E	Comment Status	A
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ISO/IEC 8802-5 does not contain cable specification for IBM Type 1 cable.

SuggestedRemedy

If a reference is needed for IBM Type 1 cable I would suggest ISO/IEC 11801:1995 be used since this is where the electrical specifications are contained. The cable is referred to as STP. I would recommend that this paragraph be removed= completely since there are a number of 150 cables, not just STP, may not meet the differential skew requirement.

Proposed Response	Response Status	W
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Partial Accept: correct reference to ISO/IEC11801:1995. The referenced= cable is in common use in network environments, in many instances with proper connectors and pinouts. For short links these cables may meet cls39 requirements. However, since this cable is= not manufactured to any specific skew characteristics it may not be usable in longer cables.

P802.3z Draft 3.0 Comments

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CI 39 **SC** 39.4 **P** 39.8 **L** 18

Comment Type E **Comment Status** A

Recommend `have` be changed.

SuggestedRemedy

Change `have` to `consist of`.

Proposed Response **Response Status** W

Accept

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CI 39 **SC** 39.4 **P** 39.8 **L** 18

Comment Type E **Comment Status** A

Recommend a sentence be added to the beginning of this section to describe the purpose of the jumper cable.

SuggestedRemedy

Add the following sentence to the beginning of the sub-clause.

 `A jumper cable, which is described in this clause, shall be used to inter-connect 1000BASE-CX PMDs.`

Proposed Response **Response Status** W

Conditional accept: put "Jumper cables, described in 39.4, are used to= inter-connect 1000BASE-CX PMDs" into 39.1, the introduction.

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CI 39 **SC** 39.5.2 **P** 39.9 **L** 44

Comment Type E **Comment Status** A

Change title of clause

SuggestedRemedy

Remove the word `Balanced` since there is no reference to it clause 39.4.

Proposed Response **Response Status** W

Reject: Change line 18 to "A 1000BASE-CX compliant... and shielded, balanced=cable...."

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CI 39 **SC** 39.5.2 **P** 39.9 **L** 46

Comment Type E **Comment Status** A

Suggest `plug or male` be changed to `plug (male)` and `receptacle or female` to `jack (female)`.

SuggestedRemedy

See above

Proposed Response **Response Status** W

Accept - Previously agreed to remove male and female per other comment.

P802.3z Draft 3.0 Comments

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CI 39 **SC** 39.7.4.2 **P** 39.15 **L** 09

Comment Type E **Comment Status** A

Regarding PM-3, I believe the main intent 39.3.1 was to specify the transmitter eye diagram.

SuggestedRemedy

add PICS item "PM-x, transmitter eye diagram, 39.3.1, M, Yes[], meets requirements of figure 39-3 and 39-4 when terminated as shown in TP2.

Proposed Response **Response Status** W

Accept: Additionally, change 39.3.1 "The signal requirements... Table 39-1" to "The transmitter shall meet the specifications in Table 39-1." This required the addition of a new PIC.

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CI 39 **SC** 39.7.4.2 **P** 39.15 **L** 16

Comment Type E **Comment Status** A

Regarding PM-7, the receiver BER cannot be measured without mandating the conditions under which the requirement should be met.

SuggestedRemedy

Change PM-7 to, "PM-7, receiver eye diagram, 38.3.2, M, Yes[], meet BER objective of 10⁻¹² when signal delivered to receiver meets requirements specified in figure 39-5"

Proposed Response **Response Status** W

Reject: The group decided to not use BER as a specification methodology for jumper cable assemblies. Reference to BER in 39.3.2 will be removed along with the associated PIC.

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CI 39 **SC** 39.7.4.2 **P** 39.15 **L** 35

Comment Type E **Comment Status** A

Jumper cable requirements shown in Table 39-6 do not appear in PICS.

SuggestedRemedy

Add an item to the PICS to reflect the jumper cable requirements shown in Table 39-6.

Proposed Response **Response Status** W

Reject: There is a typo in LI-1. The content of the value/comment column will be changed the table reference from 39-4 to 39-6. Add "table 39-6" to the feature column.

P802.3z Draft 3.0 Comments

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CI 39 **SC** Figure 39-1 **P** 39.3 **L** 1
Comment Type E **Comment Status** A
 Suggest the text at the top of the figure be changed.

SuggestedRemedy
 Change text to read 'Shielded Jumper Cable', which is much more descriptive. Also, clause 39.4 does not indicate the jumper contains 'balanced pairs'.

Proposed Response **Response Status** W
 Accept

Comment ID 33 **Topic**
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CI 39 **SC** Figure 39-1 **P** 39.3 **L** 1
Comment Type E **Comment Status** A
 Modify Figure 39-1 to increase clarity for reader.

SuggestedRemedy
 Suggest the following to increase clarity of Figure 39-1.
 1. Place dotted lines around transmit and receive portions to show what is inside equipment.
 2. Add '1000BASE-CX' to Transmit Network and Receive= Network.
 3. Show a connector between T+/T- and 1000BASE-CX Transmit Network and between R+/R- and 1000BASE-CX Receive= Network.

Proposed Response **Response Status** W
 Accept 1 and 2. Reject 3: A connector at this location would be an implementation choice which while not specifically disallowed by the standard, is not encouraged. This is the reason that TP1 and TP4 are not compliance points, since these are not measurable in a system environment. Additionally, add the words "(half link is shown)" to the 39.1 title.