IEEE P802.11
Wireless LANs

Comments received on 802.11b in Letter Ballot 17

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We received comments from the following persons:

Voter id	Full name
db	David Bagby
jbo	Jan Boer
ah	Allen Heberling
kk	Kevin Karcz
bo	Bob O'Hara

The comments are provided in the following table starting on the next page:

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
1	9.2	Ah	"e"	Yes	Line54: "… virtual Carrier Sense mechanism, all STAs must be able to detect…" Why has this been changed to must from shall? Is this saying that support of RTS and CTS will now be optional for 802.11b?	Please replace must with shall.	
2	10.3.10.1.2	Ah	"e"	No	Displayed Table, Line 22: …(in Kus). DTIM Period | As defined in Frame Format. CF parameter set | As defined in Frame Format. PHY parameter set | As defined in Frame Format. IBSS parameter set | As defined in Frame Format. Capability Information | As defined in Frame Format.	Change Kus to TU. Change Frame Format to 7.3.2.6 Change Frame Format to 7.3.2.5 Change Frame Format to 7.3.2.3 or 4. Change Frame Format to 7.3.2.7 Change Frame Format to 7.3.1.4	
3	18.2.1	Ah	"e"	No	Last Paragraph, 1st sentence: typo equipments	Change to equipment	
4	18.2.3.4	Ah	"e"	No	Table 1. d0, d1, d2, etc	Since these are not dibits please change d0 etc to b0, b1, b2, etc.	
5	18.2.3.5	Ah	"e"	No	2nd paragraph, Line 44: …bit position d7…	Since this is not a dibit please change to b7.	
6	18.2.3.5	Ah	"e"	No	Table 2. Line 54, floor(X) is 1027 yet Rx Octets is 1026.	Please resolve discrepancy or clarify my misunderstanding.	
7	18.2.5	Ah	E	Yes	Figure 7 is not clear, especially when compared with Figure 120 in IEEE 802.11a/D3.0	Please acquire a copy of Figure 120 and modify.	
8	18.2.6	Ah	E	Yes	Figure 9 is not clear, especially when compared with Figure 122 in IEEE 802.11a/D3.0	Please acquire a copy of Figure 122 and modify.	

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9	18.3.5	Ah	E	Yes	Clause 18.3.5 is overly terse and seems out of place in its current location.	See clauses 17.2.2 through 17.2.3.2 of IEEE P802.11a/D3.0 for a less terse implementation. Move clause 18.3.5 to just after clause 18.2.1 and re-label it as 18.2.2. TXVector parameters and 18.2.3 RXVector parameters. Obviously, the current clause labeled 18.2.2 PPDU format will get bumped up to the next clause sequence after this insertion.	
1.	7.3.1.4 lines 29, 44	bo	T	n	"STAs" should be "APs" in this paragraph.	change "STA" to "AP"	
2.	7.3.1.4 line 7	bo	e		The first sentence of this paragraph should be moved to be a separate paragraph after the current paragraph. Also, the "remaining bits" should be identified.	Move the sentence and insert "(bits 8-15)" after "remaining bits".	
3.	9.2 page 9 line 1	bo	T	n	"must has no meaning in a standard. The word "shall" denotes a normative requirement.	Undelete "shall. Delete "must".	
4.	10.4.3.1	bo	T	Y	There are no references to sMPDUDurationFactor in 10.4.3.1. However, if what was meant was 10.4.3.2, this change may not be made as it makes existing PHY implementations non-conformant.	Eliminate the instruction to remove references to aMPDUDurationFactor	
5.	14	bo	T	Y	Elimination of aMPDUDurationFactor from existing PHYs makes all existing PHYs non-conformant. Breaking all existing PHYs is not within the scope of the PAR to develop a higher speed extension PHY.	Delete this instruction.	

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6.	14.10	bo	T	Y	Adding functionality to existing PHYs, and thereby breaking all existing implementations is not within the scope of the PAR to develop a higher speed extension PHY.	Delete this instruction.	
7.	15	bo	T	Y	Elimination of aMPDUDurationFactor from existing PHYs makes all existing PHYs non-conformant. Breaking all existing PHYs is not within the scope of the PAR to develop a higher speed extension PHY.	Delete this instruction.	
8.	15.3.4	bo	T	Y	Adding functionality to existing PHYs, and thereby breaking all existing implementations is not within the scope of the PAR to develop a higher speed extension PHY.	Delete this instruction.	
9.	16	bo	T	Y	Elimination of aMPDUDurationFactor from existing PHYs makes all existing PHYs non-conformant. Breaking all existing PHYs is not within the scope of the PAR to develop a higher speed extension PHY.	Delete this instruction.	
10.	16.5	bo	T	Y	Adding functionality to existing PHYs, and thereby breaking all existing implementations is not within the scope of the PAR to develop a higher speed extension PHY.	Delete this instruction.	
11.	18 line 2	bo	E		Delete the "hereinafter" stuff. This belongs in the first paragraph, not the clause title.		
12.	18.2.5 Figure 11 lines 22, 23	bo	T	n	PMD_TXEND.req and PMD_TXEND.conf should both be PHY primitives, not PMD.	Replace "PMD" with "PHY" in two places.	

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13.	18.2.6 Figure 17 lines 18, 19	bo	e		There seems to be an extra line in the box labeled "set RATE"		
14.	18.2.6 Figure 17	bo	T	n	There seems to be no particular state that should be entered on reset.	Add a Reset transition to the Idle state.	
15.	18.3.5 line 10	bo	e		Change the column heading "Associate Vector" to "Associated Vector"		
16.	18.4.5. 3.3 lines 4, 5	bo	e		The last sentence is a bit tortured, don t you think? Wouldn t "X should be issued prior to Y" work better?		
17.	18.5.4. 4.3 lines 44, 45	bo	e		The last sentence is a bit tortured, don t you think? Wouldn t "X should be issued prior to Y" work better?		
18.	18.4.5. 6.1 line 53	bo	e		replace "reqauest" with "request"		
19.	18.4.5. 12.1 line 45	bo	t	n	The MAC does not receive RSSI from the PMD.	Remove the reference to the MAC.	
20.	18.4.6. 2 Table 15	bo	E		It would be best to keep this table all in one piece, not split over a page boundary.		
21.	18.4.6. 5 line 25-36	bo	E		Is there a change in this equation? I can t see any.		
22.	18.4.6. 7	bo	T	Y	All references to frequency hopping were to be deleted from the normative sections of the standard as the resolution of multiple comments. All that was to be left in the HS PHY was a channel settling time.	Delete 18.4.6.7 and all sublclsuses.	

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23.	18.4.6.12 line 11	bo	T	n	"is defined as" has no meaning in a standard.	Replace "is defined as" with "shall be".	
24.	18.4.7.7 Figure 31	bo	T	n	This figure shows an overshoot of the max TX power without defining the allowable value of this overshoot in either the text or the figure.	Define this overshoot value or change the figure.	
25.	18.4.8.4 lines 49, 50	bo	e		Remove italics.		
26.	A.4.8 PICS	bo	e		Precede each Item number (in the first column of the tables) that is used as a conditional precedent in the Status column with an asterisk (*).		
27.	A.4.8 HRDS7 PICS	bo	E		Don t reuse the option identifiers. "O.1" is already used in the PICS. Use the next available integer. I realize that this is done in the FH and DS PICS. It is wrong there and was not caught.		
28.	A.4.8 HRDS11 PICS	bo	E		Don t reuse the option identifiers. "O.2" is already used in the PICS. Use the next available integer. . I realize that this is done in the FH and DS PICS. It is wrong there and was not caught.		
29.	A.4.8 HRDS16 PICS	bo	E		Don t reuse the option identifiers. "O.2" is already used in the PICS. Use the next available integer. . I realize that this is done in the FH and DS PICS. It is wrong there and was not caught.		

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
30.	Annex C line 12-16 on pg 84 and lines 12-29 on pg 85	bo	T	Y	Elimination of aMPDUDurationFactor from existing PHYs makes all existing PHYs non-conformant. Breaking all existing PHYs is not within the scope of the PAR to develop a higher speed extension PHY.	Change this instruction add the use of the TXTIME primitive when using the HR PHY. The details of the change to the formal description must also be included in this instruction.	
31.	Annex D line 29 on pg 90	bo	T	n	"{dot11PhyHRDSSSEntry 6}" duplicates an earlier entry.	Give this item a number of its own.	
32.	Annex F line 1	bo	E		Insert "High Rate PHY" before "frequency hopping".		
33.	Annex F	bo	E		Insert the frequency hopping stuff from 18.4.6.7 and its subclauses into this annex.		
1	18.2.3.1 18.2.3.8	JBo	t		I could not reproduce the 8 bits that have to come out of the scrambler first.Should be for the long preamble 17H and for the short preamble 98H	Change accordingly	
2	18.2.3.1	JBo	t		I do not see the benefit to preset the scrambler at the long preamble. In the legacy 802.11 DSSS standard the prese value is free. Since you do not know at what rate the frame you are going to receive is sending until after the preamble, you can not make use of the preset in the training (can also be a frame of the legacy DSSS)	Delete preset requirement	

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3	18.2.3.4	JBo	t		Both Harris and Lucent have analyzed the timing requirements and possible timing algorithms for 5.5 and 11 Mbit/s CCK. The independent conclusion is that if the LO-oscillator and the sample clock in the transmitter are not coupled the receiver will have substantial lower performance than in the case where the clocks are coupled, while the receiver knows this and makes use of it. Since the standard aims for high performance systems I propose to facilitate clock coupling and notify this to the receiver through the service field. Implementers still have the choice whether to couple the clocks or not, but should be aware that they pay a performance penalty if they do not. I have prepared some viewgraphs to explain the issue (doc 61).	Define in the service field dx: dx=1 indicates that the LO and sample clocks are coupled in the transmitter (only to be used for 5.5 and 11 Mbit/s rate) . Add paragraph describing that it is highly recommended to couple the clocks ;if the clocks are not coupled a worse packet error rate can be expected.	
1	18.2.5 P. 23 L. 52	sl	e	n	Eliminate the reference to HR/DSSS/PBCC PHY The term High Rate PHY is includes both PBCC and CCK modulations		
2	18.4.6.3 P. 45 L. 46	sl	E	n	Remove the sentence "Designers are cautioned that inclusion into this standard does not mean that either high rate … in any given regulatory domain." As a standards body promoting 802.11 2.4 GHz products, we should promote our technology and not cause any un-necessary alarm that our own standard will not pass FCC or other tests. This will cause customers to go to another technology.	Remove the sentence.	

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3	18.4.6.6 P. 48 L. 53	sl	e	n	Change the wording of the sentence "The encoded data is then covered before transmission through the channel." The verb covered seems ambiguous.	"A cover code is applied to the encoded data prior to transmission through the channel"	
4	18.4.6.6	sl	e	n	Clean up Figure 12. Is not clean or uniform relative to the other figures.		
5	18.4.6.6 P. 50 L. 4	sl	e	n	Change the wording of the sentence "In QPSK mode … from the BCC is taken serially and used to produce two PSK symbols." to " … two BPSK symbols." Makes the sentence less ambiguous.		
6	18.4.6.6 P. 50 L. 7	sl	e	n	Use the term PSDU instead of MPDU in the sentence "The phase of the first complex chip of the MPDU shall be defined …" We seem to be using the terms PSDU instead of MPDU in the entire document.		

Re motion 2, 802.11b: The response to my comments submitted to the previous LB are not sufficient. The technical changes required to change my vote were not adopted. I still believe the draft to be significantly flawed for the same reasons articulated in my previous LB comments. In particular the existence of the options I called out previously, enable (and encourage) vendors to create high speed PHYs that may not interoperate – this is in contradiction to the charter of the group to produce A SINGLE higher speed PHY specification for 2.4 GHz.
For reference the comments submitted with LB 16 are reproduced below. My previous comments are just as valid now as before the committee's response.

Comments to accompany LB 16 vote from David Bagby.

4 Jan 1999

These comments are not placed in a comment table because they are by nature comments that apply to large portions of the impacted drafts – fell free to paste them into a comment table in order to give them a comment number for processing.

Re 802.11b:
Vote: No.
Reasons: The PHY specification contains options.
802.11 has voted that options shall be minimized and included only when absolutely necessary (see previous meeting minutes). The presence of following options mandate a No vote:

Short PLCP frame format
FH PLCP frame format
DSSS/PBCC Data Modulation and Modulation rate

Additionally, the 2.4 GHZ high speed PHY effort was chartered with a specific purpose and was restricted by 802.11 to the definition of a ***SINGLE*** 2.4Ghz higher speed PHY.

The inclusion of these options specifically violates the letter as well as the spirit of that charter and is in direct contradiction of the decision under which the group was chartered. Until the draft specifies a single 24GHz PHY the group has not met it's goal or charter. (Note: This is a serious issue that I feel strongly enough about to push all the way to exec com if necessary.)

To resolve the issue I suggest that the group adopt the following w.r.t. to each option:
Short PLCP frame format:

First choice = Remove the long PCLP header and mandate use of only the short header.

This would create a high-speed PHY which would actually provide some of the thruput performance promised by the increased bit rate. This would also remove the antenna to antenna backward PHY compatibility that the current draft contains. I personally do not think that is important (from a business standpoint as the installed base of low speed DSSS units is negligible). However if the group still feels that this antenna to antenna compatibility is important, I could live with choice 2.

Second choice = Make the support of the short header required. While this will result in a lower performance system that the first choice, it will help somewhat – but only if all stations contain the short header support.

What is not acceptable is to leave the short header optional. The use of the short header as an option does not provide the backwards compatibility that is used to justify the long header, and it does not provide any increased performance due to the swamping impacts of the long header on thruput.

FH PLCP frame format

Make the option mandatory.

If I am to believe the arguments that cry about interoperation with the installed FH base, then an option is inappropriate. Either the market requires the compatibility or it does not. In my view the potential negative impact on market perception from not being able to communicate (directly or indirectly) to high speed 2.4 units from installed FH units mandates that this feature be mandatory. The prospect of utilizing a dual AP structure for indirect connectivity is economically unattractive and does not held the ad-hoc cases.

DSSS/PBCC Data Modulation and Modulation rate

Delete this option from the draft. The truth is that it was included as a political compromise to get votes for the current draft. While I understand the sequence of events that lead to the option, they are not sufficient to include an option that violates the single PHY charter requirement. In this case there is no backward compatibility argument as this modulation does not exist in prior versions of 802.11 PHYs. I also do not think that the option adds sufficient utility to justify its complexity and hence can not vote yes if this option were made mandatory.