IEEE P802.11
Wireless LANs

Comments resolved 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
sl	Stanley Ling
gc	Greg Czumak, FCC

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

1.	Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
2.	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.	accepted
3.	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.	Accepted, Editor will make the figure align vertically so that comments in text can be better added to the figure
4.	8	18.2.6	Ah	E	Yes	Figure 9 is not clear, especially when compared with Figure	Please acquire a copy of Figure 122 and modify.	Accepted, See above

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						122 in IEEE 802.11a/D3.0		
5.	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.	Rejected, the organization is consistent with clause 15 and technically accurate and clear

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6.	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	accepted

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7.	3	18.2.1	Ah	"e"	No	Last Paragraph, 1st sentence: typo equipments	Change to equipment	accepted
8.	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.	accepted
9.	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.	accepted
10.	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.	Rejected, editor will explain the process to the commenter
11.	4.	10.4.3.1	bo	T	Y	There are no references to aMPDUDurationFactor in 10.4.3.1. However, if what was meant was 10.4.3.2, this change may not be made as it	Eliminate the instruction to remove references to aMPDUDurationFactor	Accepted, Editor will change paragraph to only remove this factor from high rate capable equipment

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						makes existing PHY implementations non-conformant.		
12.	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.	Accepted, See above
13.	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	Delete this instruction.	Accepted, Eliminate this text in sect 14, text is in section 18

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						higher speed extension PHY.		
14.	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.	accepted
15.	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	Delete this instruction.	Accepted, Delete this text in clause 15

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						extension PHY.		
16.	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.	accepted
17.	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.	accepted

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18.	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.	accepted
19.	30.	Annex C line 12-16 on pg 84	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	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	Accepted, editor will fix

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		and lines 12-29 on pg 85				speed extension PHY.	included in this instruction.	
20.	1.	7.3.1.4 lines 29, 44	bo	T	n	"STAs" should be "APs" in this paragraph.	change "STA" to "AP"	Accepted, Editor will work with bob to make changes as recommended
21.	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".	accepted
22.	12	18.	bo	T	n	PMD_TXEND.req and	Replace "PMD" with	accepted

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	.	2.5 Figure 11 lines 22, 23				PMD_TXEND.conf should both be PHY primitives, not PMD.	"PHY" in two places.	
23.	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.	accepted
24.	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.	Accepted, Remove "and MAC entity"
25.	23	18.	bo	T	n	"is defined as" has no	Replace "is defined	accepted

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	.	4.6.12 line 11				meaning in a standard.	as "with "shall be".	
26.	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.	Accepted, Fix figure
27.	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.	Editor will fix numbering
28.	2.	7.3.	bo	e		The first sentence of	Move the sentence	Separate

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		1.4 line 7				this paragraph should be moved to be a separate paragraph after the current paragraph. Also, the "remaining bits" should be identified.	and insert "(bits 8-15)" after "remaining bits".	sentence from paragraph and define bits
29.	11.	18 line 2	bo	E		Delete the "hereinafter" stuff. This belongs in the first paragraph, not the clause title.		Accepted, move to first paragraph
30.	13.	18. 2.6 Figure 17 lines 18,	bo	e		There seems to be an extra line in the box labeled "set RATE"		accepted, fix figure

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		19						
31.	15.	18.3.5 line 10	bo	e		Change the column heading "Associate Vector" to "Associated Vector"		accepted
32.	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?		Accepted, change to "is normally issued" to convey the idea that sometimes, the implementer may do it otherwise.
33.	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?		Accepted, see above

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34.	18.	18.4.5.6.1 line 53	bo	e		replace "reqauest" with "request"		accepted
35.	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.		accepted
36.	21.	18.4.6.5 line 25-36	bo	E		Is there a change in this equation? I can t see any.		Editor will remove change bars
37.	25.	18.4.8.4	bo	e		Remove italics.		accepted

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		lines 49, 50						
38.	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 (*).		Accepted, Editor will get with bob to identify the fixes
39.	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		Accepted, Editor will get with bob to identify the fixes

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						caught.		
40.	28.	A.4.8 HR DS11 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.		Accepted, Editor will get with bob to identify the fixes
41.	29.	A.4.8 HR DS16 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		Accepted, Editor will get with bob to identify the fixes

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						caught.		
42.	32.	Annex F line 1	bo	E		Insert "High Rate PHY" before "frequency hopping".		accepted
43.	33.	Annex F	bo	E		Insert the frequency hopping stuff from 18.4.6.7 and its subclauses into this annex.		accepted
44.	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	Withdrawn
45.	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 preset value	Delete preset requirement	Disapproved by group, presetting will potentially improve high rate systems

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						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)		
46.	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	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	Accepted, editor will fix Put in 18.2.3.4: Bit 2 shall be used to indicate whether or not the transmit frequency and transmit chip clocks are derived from the same oscillator (locked) <1> or not <0>.

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						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	to couple the clocks .	This Locked Clocks bit shall be set by the PHY layer based on its implementation configuration. Put in 18.4.7.4: The PN code chip clock frequency tolerance shall be better than ±25 ppm maximum. *It is highly recommended that the chip clock and the transmit frequency be locked (coupled) for optimum demodulation per-*

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						the issue (doc 61).		*formance .If these clocks are locked, it is recommended that bit 2 of the SERVICE field be set to a 1 as indicated in paragraph 18.2.3.4.*
47.	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		accepted
48.	2	18.4.6.3 P. 45	sl	E	n	Remove the sentence "Designers are cautioned that inclusion into this standard does not mean	Remove the sentence.	Accepted

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		L. 46				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.		
49.	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."	"A cover code is applied to the encoded data prior to transmission through the channel"	accepted, editor will fix

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						The verb covered seems ambiguous.		
50.	4	18.4.6.6	sl	e	n	Clean up Figure 12. Is not clean or uniform relative to the other figures.		Accepted
51.	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.		Accepted, change PSK to BPSK
52.	6	18.4.6.6 P.	sl	e	n	Use the term PSDU instead of MPDU in the sentence "The phase of		accepted

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		50 L. 7				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.		
53.	1	18.4 .7.4	gc	t	n	The resolution bandwidth of the measurement of transmit spectral mask should not be 30kHz	change the 30 kHz to 100 kHz	accepted
54.	1	all	db	T	y	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	Delete or make mandatory the short preamble option. Make mandatory the FH option. Delete the PBCC option.	Rejected, the FH PLCP frame format option has been deleted **IEEE802.11 Task Group B has considered this comment at length but respectfully declines the proposed changes.**

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						presence of following options mandate a No vote: Short PLCP frame format FH PLCP frame format DSSS/PBCC Data Modulation and Modulation rate		The group understands and appreciates fully IEEE802.11's agreed position on options within the standard and its charter to produce a single IEEE802.11 high rate PHY. It is our belief that we have not violated either requirement. Our reasoning is based on both logical argument and considering and comparing to prior policy in other task groups under the same committee working to the same agreed guidelines. Several motions were put forth with the exact concerns expressed here and were voted down by the group. Consideration of this

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								comment started with the question of whether the draft standard as published represents a single PHY. To resolve this question one has to agree on what defines a single PHY. One way to define this is to consider that the specification represents a single PHY if all implementations interoperate successfully. When tested against this criterion the published draft does represent a single PHY. Where there are options, sufficient thought has been given to ensure that these do not sacrifice interoperability. As an example, consider the current published IEEE802.11 standard. The two PHY layers

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								defined at 2.4GHz do not interoperate at all. They are clearly understood to be two separate PHY layers. Consider next the IEEE802.11 MAC. It is common knowledge that IEEE802.11 has one MAC. That was the working group charter. However, this MAC contains at least four options: WEP security, the point coordination function, a strictly ordered service class and multiple outstanding MSDU support. None of these options affect base interoperability. Indeed, experience is now revealing an excellent degree of interoperability between different vendors products. We do not argue that IEEE802.11

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								has multiple MAC layers just because it has several options. One could argue that the implementation of PBCC, or the short header are very significant options since they affect the basic transfer of information. However, it is permissible for a MAC implementation to mandate WEP usage (using ExcludeUnencrypted) and this is at a similar basic communication level. The MAC group did not mandate the use of WEP just as the TGb is not mandating the use of the short header option. The group considered the IEEE802.11 guidelines on options; a

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								position that we understand to have been based on an attempt to achieve the greatest chance of successful interoperability. We reviewed each of the three options within the HR DSSS draft and feel that each offers a given advantage but at a cost. Having such diversity in the standard is not necessarily bad. It allows product differentiation without sacrificing interoperability and allows a spectrum of cost/performance products to come to market. We also note that there is a standard method of dealing with optional items so that their significance is clear to implementers, suppliers, acquirers,

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								users and protocol testers. That mechanism is the PICS. We assume that the MAC task group chose to make the above named functions options to provide this diversity. We know that this has not sacrificed interoperability as has now been proven by extensive UNH testing and field experience. We are aware that the inclusion of options can be criticized as the inability to reach a consensus. Indeed the PCF option in the IEEE802.11 MAC is interpreted by many as a political compromise between the CSMA distributed and polled deterministic MAC protocols that competed during the development

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								of the standard. If consensus can be reached by making a function an option without sacrificing interoperability then perhaps this is a successful strategy. Based on this reasoning and looking to the example of other task groups in IEEE802.11 we reached our consensus.