IEEE P802.11
Wireless LANs
Comments received on 802.11a in Letter Ballot 16

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The following persons have sent comments on draft standard 802.11aD1.6.
Note that the yellow highlighted voter ID indicates that the person is not a voter.

lastname	firstname initials	Voter id
Andren	Carl F.	ca
Chayat	Naftali	nc
Ennis	Greg	ge
Fischer	Michael	mif
Hayes	Victor	vh
Heegard	Chris	ch
Heiskala	Juha	jh
Kawaguchi	Dean M.	dk
Moelard	Henri	hm
Morikura	Masahiro	moa
Nee	Richard van	rvn

O'Hara	Bob	bo
Okanoue	Kazuhiro	ko
Petrick	Al	ap
Sanwalka	Anil K.	as
Shoemake	Matthew B.	mbs
Tom	Cherry	ct
Tsoulogiannis	Tom	tt
Ward Jr.	Robert M.	rw
Webster	Mark	mw
Wilz	Leo	Lw
Worstell	Harry	Hw
Zelenty (IEEE editor)	Valerie	vz

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	1.3.1.1	ch	T	YES	There are undefined variables in this section. This section leaves ambiguity in the description of the modulation. The main data variable rDATA is not even defined.	The author of this section needs to go back through it and work to make it bulletproof.	
2	1.3.3.11	ch	t	YES	There is no reason to carry around all of the square roots in tables 6 through 9. Normalization is not necessary and thus is confusing.	Remove square roots.	
1	1.3.10	AS	E	N	Replace figure 17 with the correct version of figure 94 from Tgrev.		
2	1.5.1	AS	T	Y	The characteristics described in Table 14 are defined as static integer values in Clause 10.4.3.2 in the standard. The MAC does not expect them to change during operation. TGb had a similar problem and it was resolved by adding a new pair of primitives to clause 10 to retrieve extended PHY characteristics. The parameters for the confirm are PHY dependent, so a set of static parameters could be defined for this PHY to accommodate the different values of aPreambleLength and aPLCPHeaderLength.		
1	1.2.3.2	ca	t	Y	Text states that absolute accuracy of RSSI is not specified, but clause 1.3.8.5 specifies +/-6 dB and monotonic over levels of -89 to -30 dBm.	Change text to: "Accuracy of the RSSI is specified in clause 1.3.8.5."	
2	1.3.2	ca	t	Y	Figure 3 should show the PPDU tail field and the PLCP preamble is shown as 11 symbols but it is 12 symbols (9 short, 2 long and 1 short)	Add PPDU tail field to the figure and change PLCP preamble length to 12 symbols	
3	1.3.3.1	ca	e	Y	Line 29 indicates t_{11} whereas all other text and figure 4 indicates only 10 short symbols.	Change t_{11} to t_{10}	
4	1.3.3.3	ca	t	Y	The first 7 transmitted bits are set to zero here (12-27) whereas in 1.3.3.7 (14-9) the first byte is set to zeros.	Decide which it is and make both agree.	

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5	1.3.3.8	ca	e	Y	**Paragraph heading calls this a PLCP tail, but it is a PPDU tail.**	**Change title to "PPDU Tail Bit Field"**	
6	1.3.3.10	ca	t	Y	**The equation appears to be backwards. It specifies the deinterleaving equation rather than the interleaving equation.**	**Change to i=F(k) instead of k=F(i)**	
7	1.3.4	ca	T	Y	**The CCA mechanism based on RSSI is not robust. The accuracy of the RSSI is too lose to establish a proper threshold. The setting of the threshold is not adequately specified, nor is the criterion for setting it. Further, the response of the system to CCA not passing threshold is not specified sufficiently.**	**Add a requirement that the equipment establish the noise floor via measurement and use this to calibrate the threshold.** **Add text similar to the DS PHY:** The OFDM PHY shall provide the capability to perform CCA according to at least one of the following three methods: *CCA Mode 1:* Energy above threshold. CCA shall report a busy medium upon detecting any energy above the ED threshold (aTIThreshold). *CCA Mode 2:* Carrier sense only. CCA shall report a busy medium only upon the detection of a valid OFDM signal. This signal may be above or below the ED threshold. *CCA Mode 3:* Carrier sense and energy above threshold. CCA shall report a busy medium	

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						upon the detection of an OFDM signal and energy above the ED threshold. The energy detection status shall be given by the PMD primitive, PMD_ED. The carrier sense status shall be given by PMD_CS. The status of PMD_ED and PMD_CS is used in the PLCP convergence procedure to indicate activity to the MAC through the PHY interface primitive PHY-CCA.indicate. A busy channel shall be indicated by PHY-CCA.indicate of class BUSY. Clear channel shall be indicated by PHY-CCA.indicate of class IDLE. The PHY MIB attribute dot11CCAModeSupported shall indicate the appropriate operation modes. The PHY shall be configured through the PHY MIB attribute dot11CurrentCCAMode. The CCA shall be TRUE if there is no energy detect or carrier sense. The CCA parameters are subject to the	

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						following criteria: If a valid OFDM signal is detected during its preamble within the CCA assessment window, the energy detection threshold shall be less than or equal to –76 dBm. With a valid signal (according to the CCA mode of operation) present at the receiver antenna within 2 μs of the start of a MAC slot boundary, the CCA indicator shall report channel busy before the end of the slot time. This implies that the CCA signal is available as an exposed test point. Refer to IEEE 802.11-1997 Figure 47 for a slot time boundary definition. In the event that a correct PLCP Header is received, the OFDM PHY shall hold the CCA signal inactive (channel busy) for the full duration as indicated by the PLCP LENGTH field.	

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						Should a loss of carrier sense occur in the middle of reception, the CCA shall indicate a busy medium for the intended duration of the transmitted frame. Conformance to OFDM PHY CCA shall be demonstrated by applying a OFDM compliant signal, above the appropriate ED threshold (a), such that all conditions described in b) and c) above are demonstrated.	
8	1.3.6.1	ca	e	Y	The font in figure 10 needs to be fixed to stay within the boxes.	Fix figure text.	
9	1.3.7.3	ca	e	Y	"geographic" does not belong in this sentence.	Replace the word "geographic" with "political".	
10	1.3.8.2, 1.3.8.3, 1.3.8.4	ca	e	Y	specifications are TBD	Replace -Xs with numbers	
11	1.3.8.5	ca	e	Y	Reception Level Detection is not called RSSI here, but what else could it be?	Clarify what is meant in this paragraph. Call it RSSI if that is what it is. Indicate how it relates to RSSI if it is not. Indicate the mechanism by which the information is passed to the MAC and what the MAC should do with it.	
12	1.3.9	ca	e	Y	Figure 14 appears to show the Tail Bit(s) as encoded+scrambled whereas 1.3.3.8 says they are replaced by unscrambled bits before encoding. Which is it? Also, the font needs fixing to keep the text within the boxes.	Show tail bits properly handled and fix font.	

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13	1.3.9	ca	e	Y	The text in figure 15 falls outside the boxes	Fix font	
14	1.3.9	ca	e	Y	The transmit state machine does not show the appending of the Tail	Add a block to show the Tail appending	
15	1.3.10	ca	e	Y	The last sentence (29-33) is awkward.	Change to: "Any data received after the indicated data length are considered Stuff Bits (to fill out an OFDM symbol) and should be discarded. "	
16	1.3.10	ca	e	Y	There are extraneous lines on Figure 16 and the font strays outside the boxes. Tail bits are again shown as scrambled whereas they may not be.	Fix extra lines and oversize font. Indicate proper state of Tail Bits	
17	1.3.10	ca	e	Y	The text strays outside the boxes on Figure 17	Fix the font	
1	1.3.6.3	ko	T		It seems that channelization has not been fixed yet.	Fix channelization.	
2	1.3.6.7.2	ko	T		It seems that some parameters have not been fixed yet.	Fix the parameters.	
3	1.3.8.2	ko	T or E		A value of maximum input level seems not be fixed.	Fix the value.	
4	1.3.8.3	ko	T or E		Adjacent channel rejection levels seem not be fixed.	Fix the levels.	
5	1.3.8.4	ko	T or E		Non adjacent channel rejection levels seem not be fixed.	Fix the levels.	
1	1.3.3.7	ap	e		Figure 6	Insert Z^N taps in figure	
2	1.3.4	ap	T	N	Clear Channel Assessment using only RSSI	Implement a more robust ED detection scheme if carrier sensing is not practical.	CCA is based upon RSSI energy detection (ED). This is a simple mechanism for deferral.
1	1.3.8.1	moa	T	Y	The numbers for receiver sensitivity are small. These numbers are derived by adding 5dB margin to the computer simulation results with no degradation factor. The required received power Pr for 10% packet error rate of 1000 byte MPDU length derived	Change numbers to following values: –82 dBm for 6 Mbit/s –81 dBm for 9 Mbit/s –79 dBm for 12 Mbit/s	

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					by computer simulation for latest parameters are : Pr = –87.4 dBm for 6 Mbit/s Pr = –86.4 dBm for 9 Mbit/s Pr = –84.6 dBm for 12 Mbit/s Pr = –82.2 dBm for 18 Mbit/s Pr = –79.5 dBm for 24 Mbit/s Pr = –75.9 dBm for 36 Mbit/s Pr = –71.7 dBm for 48 Mbit/s Pr = –70.1 dBm for 54 Mbit/s (These results are with NF = 10 dB)	–77 dBm for 18 Mbit/s –74 dBm for 24 Mbit/s –70 dBm for 36 Mbit/s –66 dBm for 48 Mbit/s –65 dBm for 54 Mbit/s	
2	1.3.7.2	moa	T	Y	Allowed transmit spectrum mask (Figure 12) are tight for class AB amplifier. For instance, class AB amplifier modeled by ETSI-BRAN creates –18.5 dBr sidelobe at 9 MHz frequency offset when the amplifier operates at 5dB output back off. It seems better that the frequency offset specified for –20 dBr define at 10 MHz which is almost at adjacent channel signal edge.	Change frequency offset specified for –20 dBr to 10 MHz instead of 9 MHz in Figure 12.	
1	1.1	ct	e		should provide correct reference	This clause describes the physical layer for the Orthogonal Frequency Division Multiplexing (OFDM) sys-tem. The Radio Frequency LAN system is initially aimed for the 5.15-5.25, 5.25-5.35 and 5.725-5.825 GHz U-NII bands as provided in the USA according to Code of Federal Regulations, Title 47, Section 15.407.	
2	1.3.2 figure 3	ct	e		count of symbols for SYNC and PLCP preamble fields are incorrect based on text in	should be 12 symbols in SYNC (9 short, 2 long, 1	

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					1.3.2.1	short) and PLCP preamble	
3	1.3.2.1 1) and 2)	ct	e		Assuming name in previous diagram is correct, text should refer to SYNC field not SYNC SYMBOL	change SYNC SYMBOL to SYNC	
4	1.3.2.1 12)	ct	e		typo	change "sequel to" "sequence to"	
5	1.3.2.1 13)	ct	e		typo	minus sign should be in front of 22	
6	1.3.3.1 line 29	ct	e		typo	t11 should be t10	
7	1.3.3.1 line 31-32	ct	e		there are many dashed boundaries in figure 4	clarify or perhaps change some of the dashes to lines	
8	1.3.3.2 line 39	ct	e		typo	subscribers should be subcarriers	
9	1.3.3.3 line 28	ct	E		all zeros can't refer to reserved 9 bits or they can't be used in the future for something else in the 802.11 standard	clarify which bits with zero signify 802.11 device compliance or rephrase statement	
10	1.3.6.3	ct	T	Y	Although the current text indicates it shall be revised, this section needs to be reworked before it is approved as standard to indicate which sections are normative and which if any are informative.	If the normative text for each country/region can be determined, use specific entries for country as in current standard section 15 table 63 for DSSS PHY or section 14 separate tables for FH PHY, and there are still issues to be determined, use informative text for those.	
11	1.3.6.7	ct	t		The transmit power levels described are for the US and should be indicated as such, and if other countries will be using this standard, additional text should be added	add additional text for other countries if known or a general disclaimer indicating there are different regulatory environments etc.	
12	1.3.7.3	ct	e		typo	should be Spurious Transmissions, and text could	

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						be read something like "spurious transmissions from compliant devices shall conform to national regulations"	
13	1.3.8.2	ct	T	Y	missing maximum input level	put in appropriate value or delete	
14	1.3.8.3	ct	T	Y	missing adjacent channel rejection values	put in appropriate values or delete	
15	1.3.8.4	ct	T	Y	missing non-adjacent channel rejection values	put in appropriate values or delete	
16	1.3. 9	ct	T	Y	Service field not defined to indicate modulation rate change in this way, Signal meant?	change to SIGNAL or clarify how SERVICE field does it	
17	1.3.10	ct	t		How does the service field get out of OFDM spec? It appears to zeros except for reserved fields	clarify	
1	1.3.3.10	Dk	T	Y	The interleaving/deinterleaving scheme puts consecutive bits with the same symbol to bit map location of the gray coded 16QAM or 64QAM symbols into the FEC decoder. For example, using 16QAM, a sequence of 16 consecutive bits will be in the MSB position which has better BEP, and the next sequence of 16 consecutive bits will be in the LSB position which has worse BEP in the receiver. This is worse for the FEC decoder than if the MSB's and LSB's were consistently interlaced in the data stream going to the FEC decoder.	Change the interleaving to circularly rotate the rows by an alternating pattern of (0,1) for 16QAM and (0, 1, 2 bits) for 64QAM. None is required for BPSK or QPSK. This ensures that the input to the FEC decoder is always evenly distributed with MSB, midSB, and LSB. This also minimizes the reduction of interleaving separation that is intended by using the algorithm in the draft.	
2	1.3.7.4	Dk	T	N	It would appear that the 20 MHz spacing is not sufficient to allow use of two consecutive channels in the same geographic area. The spectral mask at the center of the next	Consider this.	

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					channel is only down about –30 dBc which does not provide much margin for near-far effects. You would have to use every other channel within a common geographic area or power control to get reasonable near-far margins. Using every other channel would only allow for 4 channels in the low and mid band. Using power control works OK with connections but not as well with asynchronous data. If you separated the channels by 32 MHz, you would get <-40 dBc but more importantly the edge of the band is outside the third order intermod lobe of the other channel. This would provide 5 channels in the lower and mid-band with about 15 dB better isolation at the edges. Adding 5 more channels interlaced in the other 5 would provide for two sets of frequencies for a total of 10 channels. Bringing the channels down from 20 MHz to 16 MHz spacing between sets degraded the bleedover by only 4 dB at the edges. You could still use adjacent channels for cellular style system installation. The distance to the band edge would have to be reduced to 28 MHz from 30 MHz.		
1	1.2.2	ge	T	y	65535 is way larger than the maximum allowed by the 802.11 MAC as currently specified (2312 data octets)	For the high data rates, we should change the MAC spec	
2	1.3.1.1	ge	e	n	r_{RF} should be written as a function of t	change r_{RF} to $r_{RF}(t)$	
3	1.3.6.3	ge	t	y	This section must be finalized before submission to sponsor ballot. The channelization defined by the standard should not depend upon "HPA characteristics".	In the first sentence, change "a channelization scheme" to "the channelization scheme". Remove the last two sentences of the first paragraph. Remove Note 1	

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						and Note 2.	
4	A.4.8	ge	T	y	OF1.2.1 through 1.2.8 seems to imply that all data rates are options.	Specify which rates are optional and which are mandatory	
5	A.4.8	ge	t	y	"Most of Europe" is unclear and the cited sections do not clarify any further	Specify geographic regions more precisely with specific channelizations	
1	1.4.2	HM	E		Reference to dot11PhyOperationComplianceGroup is incorrect.	Refer to dot11PhyOperationTable.	
2	1.4.2	HM	E		Reference to dot11PhyRateGroup with items dot11SupportedDataRatesTx and dot11SupportedDataRatesRx is incorrect.	Refer to separate dot11SupportedDataRatesTx Table and dot11SupportedDataRatesRx Table.	
3	1.4.2	HM	E		Reference to dot11PhyTxPowerComplianceGroup is incorrect.	Refer to dot11PhyTxPowerTable.	
4	1.4.2	HM	E		Reference to dot11PhyRegDomainsSupportGroup is incorrect.	Refer to dot11RegDomainsSupported Table.	
5	1.4.2	HM	E		Reference to dot11AntennasListGroup is incorrect.	Refer to dot11AntennasListTable.	
6	1.4.2	HM	E		Reference to dot11PhyRateGroup is incorrect.	Refer to dot11SupportedDataRatesTx Table and dot11SupportedDataRatesRx Table.	
7	1.4.2	HM	E		Reference to dot11PhyOFDMComplianceGroup is incorrect.	Refer to dot11PhyOFDMTable.	
1	1.2.2 Table 1	hw	T	X	No "best effort" or standard data rate	Table 1 shows multiple data rates with no suggested standard rate, would like to see one "Best Effort" standard	

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						rate at 24MB/s with the other rates optional.	
2	1.2.2.2 line 36 pp3	hw	T		**All of the data rates should be supported by the OFDM PHY**	Strike and supported by the OFDM PHY"	
3	1.3.3.1 line 29 pp10	hw	e		**Training structure consists of t1 to t10**	change t11 to t10	
4	1.3.2.1 12	hw	e		**Sequel should be sequence**	change sequel to sequence	
5	pp10	hw	T	X	**Loose definition**	Preamble is not defined in document but used inconsistently – does it include the signal field --- pp11 line 21 and line 30 and line 52 and inconsistent	
6	1.3.3.2 line 39 pp11	hw	e		**Change subscribers should be subcarriers**	Change subscribers should be subcarriers	
7	1.3.3.5 line 20 pp11	hw	e		**Figure 5 wrong?**	Arrows wrong	
8	1.3.3.10 pp17 line 9//10	hw	T		**Is definition of I and k reversed (is the input a function of the out put**		
9	1.3.3.10 pp17 line 4	hw	e		**spelling**	Change symbols to symbol	
10	1.3.7.22 line 53 pp22	hw	T	X	**dB relative to the power spectral density at the carrier frequency – looks like carrier bin has no power in it?**	By definition the carrier bin is 0 power density so how can you reference this to –20dBr	
11	Pp25	hw	e		**Table as a stand-alone has no meaning**	Should reference the table to 1.3.7.6	
12	1.3.8.3 line 3	hw	e		**typo**	Insert the word are between that and located	

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	pp26						
13	1.3.8.3 and 1.3.8.4 line 3-14 pp26	hw	t		**Adjacent channel rejection is expressed in dB at times and dBm at others**	The reference to db and dbm should all be dB.	
14	1.3.8.5 line 19 pp26	hw	e		**Add word**	-30 dBm **SHALL** have monotonically	
15	1.3.8.5 line 20 pp26	hw	e		**Add words**	and **AN** absolute accuracy **OF**(strike is)+/- 6 dB.	
16	1.5.5.1.2 line 6 Pp37	hw	e		**Typo**	"0" bits are added to FORM (strike be) an OFDM symbol.	
17	1.5.5.1.2 line 7 pp37	hw	e		typo	PHY to be encoded into **AN** OFDM	
18	1.5.5.7.4 line 4 Pp40	hw	e		typo	Add period at end of the line…	
19	A.4.5 line 20 pp42	hw	e		spelling	Change Hpooing to hopping	
20	A.4.8 line 12 Pp44	hw	T	X	**OF3.10.1 is a subset of the other 2 and should be mandatory**	Change the O to M	
21	end	hw	T	X	**Needs definitions of terms in document**	Put glossary at end of document – symbols are used for several meanings – OFDMsymbols – modulation symbols- short and long training symbols……..	
1	Table 4	jh	e		**Line 41: PLCP pleamble**	**PLCP preamble**	
2	1.3.3.1	jh	e		**Line 29: t_{11}**	**t_{10}**	
3	1.3.3.2	jh	e		**Line 39: subscribers**	**subcarriers**	

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4	1.3.7.6	jh	e		**Line 9: latter "*I(I, j, k)*"**	$I_0(I, j, k)$	
5	1.3.7.6.1	jh	t	Y	**Line 4&5: TBD**	**Define TBD**	
6	1.3.8.2	jh	t	Y	**Line 50: -X**	**Define X**	
7	1.3.8.3	jh	t	Y	**All the XXs**	**Define the XXs**	
8	1.3.8.4	jh	t	Y	**All the XXs**	**Define the XXs**	
9	A.4.8	jh	t	Y	**Line 53: -X**	**Define the X**	
1.	General	Bo	E		The top level paragraphs are not included in the table of contents, only those paragraph headings of level 4 and below.	Include the top level paragraphs on the TOC.	
2.	1.1.1 a)	Bo	T		The scope clause is not the place for conformance statements (those include the word "shall"). This clause is a general description of the area to be described in the standard.	Replace "shall" with wording more appropriate.	
3.	1.1.1 a)	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	
4.	1.1.2 line 9	Bo	E			Replace "(current standard)" with the correct document reference.	
5.	1.1.2 line 14	Bo	T		Clause 1.1 and its subclauses are all part of the introduction. This is not the place for conformance statements.	Replace "shall" with wording more appropriate.	
6.	1.1.2.4	Bo	E		This clause does not describe the service primitive notation.	Either remove "and notation" from the clause header or add a description of the notation used.	
7.	1.2.2.3	Bo	E		"should be" does not belong in this standard.	Replace with "is".	
8.	1.2.2.4	Bo	T		This parameter does not describe the number of power levels in the MIB, it describes the power level to be used for this transmission.	Correct the statement.	
9.	1.2.2.1 and	Bo	T		This parameter may have only a single value at any given time. It may take a	Correct the statement.	

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	1.2.3.1				value from the range 1-65535.		
10.	1.3.1	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	
11.	1.3.1.1	Bo	E		Describe the quoted term "complex baseband" or use terminology that does not need to be read "in quotes".		
12.	1.3.1.1	Bo	T	Y	There seem to be several terms used in equations 1 through 4 that are not defined: Re, rpreamble, rsignalling, rdata,k, tdata,Ts, rsubframe, wtsubframe, Ck.	Define these terms.	
13.	1.3.1.1	Bo	T	Y	Wt is used in equation 4. Is this the same as wt on line 11?	Correct capitalization or define Wt.	
14.	1.3.1.1	Bo	e		Insert "the" into "achieve same goal" on line 33.		
15.	1.3.2	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	
16.	1.3.2	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs. It also seems that adding two blocks to the right of the block currently labelled MSDU is not unduly difficult, as the text seems to imply.	Replace MPDU with PSDU in Figure 3. Add the Stuff and Tail bits blocks to the figure.	
17.	1.3.2.1	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	
18.	1.3.3.1 Figure 4	Bo	e		Labelling the SERVICE field "DATA" seems a bit misleading, particularly when the SERVICE field is referenced in the clause immediately above (1.3.3)	Replace "DATA" with "SERVICE".	
19.	1.3.3.1	Bo	T	Y	This clause seems like it should be specifying conformance criteria. Yet, there are no "shall" statements.	If this clause is supposed to be the specification of the PLCP SYNC field, insert "shall" in a bunch of places.	
20.	1.3.3.2	Bo	T	Y	The description of the content of the two SIGNAL symbols is not adequate to unambiguosly determine the complex values S1 and S2.	Describe in more detail or include a figure that unambiguously determines the values for S1 and S2.	

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21.	1.3.3.2 Table 5	Bo	e		Increase the width of the first column so that "Constellation" appears all on one line.		
22.	1.3.3.3	Bo	T	Y	This clause refers to transmitted bit order. There is no reference to where this is defined. The "first 7 bits" is ambiguous.	Define bit order of transmission. Define bit numbering within fields.	
23.	1.3.3.4	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	
24.	1.3.3.4	Bo	T	Y	This clause refers to transmitted bit order. There is no reference to where this is defined.	Define bit order of transmission. Definebit numbering within fields.	
25.	1.3.3.5	Bo	e		Step 3 of figure 5: delete "of" or complete the phrase/		
26.	1.3.3.5	Bo	T	Y	This clause refers to transmitted bit order. There is no reference to where this is defined.	Define bit order of transmission.	
27.	1.3.3.6	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	
28.	1.3.3.6	Bo	T	Y	The PHY knows nothing of messages, only PSDUs. This also sounds like it is placing a requirement upon the MAC (that it deliver MPDUs of particular lengths). This is not permitted.	Replace message with PSDU. Rephrase the clause to make it clear that the PLCP is extending arbitrary length PSDUs to be a multiple of NCBPS. Also is this supposed to be NCBPS or NDBPS?	
29.	1.3.3.7	Bo	T	Y	Data octets are simply bit strings. Bit strings have no inherent significance and therefore can not have an MSB or an LSB.	Define bit order of transmission in a way that does not depend on bit significance.	
30.	1.3.3.7	Bo	E		The format of figure 5 and figure 6 are different, though they both describe an LFSR.	Make the figures consistent in style.	
31.	1.3.3.10	Bo	e		Need an ellipsis (...) in equation 17. Replace "floor( )" with "⌊ ⌋"		
32.	1.3.7.2	Bo	T		It is not clear what the two differently	Clarify what this figure	

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
					colored lines represent in figure 12. Is the spectrum supposed to be between these lines or simply under the black line?	means.	
33.	1.3.8.1	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	
34.	1.3.8.2	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	
35.	1.3.8.2	Bo	T	Y	No undefined values may be left in the standard.	Define the value for "X".	
36.	1.3.8.3	Bo	T	Y	No undefined values may be left in the standard.	Define the values for each "XX".	
37.	1.3.8.4	Bo	T	Y	No undefined values may be left in the standard.	Define the values for each "XX".	
38.	1.3.8.5	Bo	T		This clause seems to be stating a requirement for minimum signal detection level. Or is it specifying that the receiver must identify and quantify the level of the received signal. Obviously, this is not clear from the text.	Rewrite this clause so that it is clear what it is specifying.	
39.	1.3.9	Bo	T	Y	This clause needs to be rewritten to eliminate mention of the MAC. It should contain a description of the transmit procedure wholly bounded by the PHY SAP and PMD SAP primitives.	Eliminate mention of the MAC.	
40.	1.3.9	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	
41.	1.3.9	Bo	T	Y	Other than the PLCP fields, the PHY does not know the semantics of the information passed across the PHY SAP. It simply knows that it has been asked to send an octet. Octets are simply bit strings. Bit strings have no inherent significance and therefore can not have an MSB or an LSB.	Define bit order of transmission in a way that does not depend on bit significance.	
42.	1.3.9 Figure	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Below the line between MAC and PHY, rename all	

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
	14					MPDUs to PSDUs.	
43.	1.3.9 Figure 15	Bo	E		The notation used in the state diagram needs to be explained. In particular, what does it mean to have PMD_TXSTART.request and other SAP primitives inside one of the state boxes?		
44.	1.3.9 Figure 15	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Remove reference to MAC and MSDU. Replace with PHY SAP primitive references.	
45.	1.3.9 Figure 15	Bo	T	Y	The state machine does not show where PHY-DATA.confirm is issued.	Add this primitive to the state machine.	
46.	1.3.9 Figure 15	Bo	T	Y	The state machine shows PHY-DATA.req (*sic*) inside a state, rather than causing a transition to a state, as is done with PHY-TXSTART.request.	Place the primitive on the appropriate transition(s).	
47.	1.3.10	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU. Eliminate reference to the MAC and replace it with SAP primitve references.	
48.	1.3.10 Figure 16	Bo	T	Y	It appears that the PHY-CCA.indicate occurs before the PMD_RSSI.indicate in the figure, while the text indicates that the opposite should be true.	Correct the figure to show the proper relationship between these primitives.	
49.	1.3.10 Figure 16	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Below the line between MAC and PHY, rename all MPDUs to PSDUs.	
50.	1.3.10 Figure 16	Bo	e		There appears to be an extraneous grey line rising from the trailing edge of "Header CRC" at the bottom of the PHY PLCP to the leading edge of "Header CRC" at the top of PHY PLCP.	Explain this line or remove it.	
51.	1.3.10 Figure	Bo	T	Y	The PHY knows nothing of MPDUs, only PSDUs.	Replace MPDU with PSDU.	

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
	17						
52.	1.3.10	Bo	T	Y	There is no indication in this state machine as to what state is entered first.	Include a transition to the idle state on reset.	
53.	1.4.2 Table 13	Bo	T	Y	There may be no TBD values in the standard.	Replace TBD with valid values or eliminate "TBD".	
54.	1.5.2	Bo	T	Y	The Overview is not the place for conformance requirements.	Replace "shall" statements.	
55.	A.4.8 OF1.2	Bo	T	Y	It seems that it is possible to build a compliant OFDM PHY that does not implement any data rate, at all. The PICS indicates that all rates are optional.	Change the PICS to indicate that at least one rate must be chosen.	
56.	A.4.8 OF2.11	Bo	T	Y	It seems that it is possible to build a compliant OFDM PHY that does not implement any of the convolutional encoders. The PICS indicates that all encoders are optional.	Change the PICS to indicate that at least one encoder must be chosen. Since this choice is tied to the choices of rates, that must be indicated, as well.	
57.	A.4.8 OF2.13	Bo	T	Y	It seems to be possible to build a compliant OFDM PHY tha does not implement any modulation. The PICS indicates that all modulations are optional.	Change the PICS to indicate that at least one modulation must be chosen. Since this choice is tied to the choice of rates and encoders, that must be indicated, as well.	
58.	A.4.8 OF3.3	Bo	T	Y	The PICS indicates that an OFDM PHY that supports more than one UNII band is not compliant. Is this really the intention?	Change the PICS to indicate that one or more bands may be supported.	
59.	A.4.8 OF3.10	Bo	T	Y	You know the drill by now.	Change to PICS to indicate that one of the temperature options must be chosen.	
60.	A.4.8 OF4.1	Bo	T	Y	The PICS indicates that an OFDM PHY that supports more than one UNII band is not compliant. Is this really the intention?	Change the PICS to indicate that one or more bands and their associated power levels may be supported.	
61.	A.4.8	Bo	T	Y	The PICS may not have any undefined	Replace "X" with a valid	

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	OF5.1.4				values.	value.	
62.	A.4.8 OF5.3	Bo	T	Y	Again the PICS indicates that no rates need to be implemented.	Fix the PICS to show that at least one rate must be chosen.	
1	1.3.8.2	lw	t	n	**Maximum input power needs to be specified.**	**I don't know what the value should be but we should have a place holder for the specification.**	
2	1.3.8.3	lw	T	Y	**We can not approve a PHY specification without having the values for adjacent channel rejection specified**	**I don't know what the values should be but we should not be going to letter ballot until they are specified.**	
3	1.3.8.4	lw	T	Y	**We can not approve a PHY specification without having the values for non adjacent channel rejection specified**	**Again, I don't know what the values should be but we should not be going to letter ballot until they are specified.**	
4	1.3.7.7	lw	e	n	**There is no section 1.3.7.7 in the spec but it does exist in the table A.4.8 OFDM PHY functions as "symbol clock frequency tolerance"**	**Put it in or remove it**	
5	1.3.7.8	lw	e	n	**There is no section 1.3.7.8 in the spec but it does exist in the table A.4.8 OFDM PHY functions as "carrier frequency tolerance"**	**I believe it is the same as center frequency tolerance. Remove it**	
1	1.3.2.1	MIF	T	YES	**Starting the OFDM coded data immediately after the Signal field is incompatible with the multirate mechanism of the 802.11 MAC UNLESS the coding and data rate used to transmit the remainder of the PLCP Header is a rate supported by all stations. It is not mandatory that the coding and data rate used for the MPDU be available at stations not addressed by a particular frame, but it is assumed that all stations can receive and decode the PLCP header, thereby knowing**	**The simplest solution is to make the 6Mbit/s data rate mandatory and to require the PLCP header to be transmitted at 6Mbit/s. In this approach, as with the existing PHYs and the 802.11B proposed PHY, the data rate indicated in the Signal field commences with the first bit following the**	

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
					the expected end time of the frame transmission. Furthermore, there must be at least one coding and data rate that is mandatory for all stations, because control frames and multicast MPDUs and MMPDUs must be sent in a manner that can be received by all stations in the BSS, as well as by other stations attempting to locate and (re)associate with the BSS.	PLCP header. Because the Service, Length, and CRC fields of the PLCP header occupy 48 bits, which exactly fill 2 OFDM symbols at the 6Mbit/s rate, there would be no need to pad the PLCP header in order to change coding at the start of the MPDU in cases where a higher rate was desired. A disadvantage to this approach is that the efficiency of a BSS able to use the higher data rates is reduced by having to send the PLCP header of every frame, as well as control frames and multicast frames, at 6Mbit/s. An alternative is to make more than one rate mandatory, and to allow the use of higher rates that are supported by all stations for the PLCP header, control frames and multicasts. The 12Mbit/s rate looks like a good candidate, because the entire PLCP header would fit in a single symbol without padding.	
2	1.3.2.1	MIF	e	no	Sub-clause (3) refers to "CRC16" which is the wrong polynomial. The correct polynomial, as is stated in 1.3.3.5, is "CCITT CRC-16."	Correct this to "CCITT CRC-16"	
3	1.3.3.2	MIF	t	no	The Signal field has 4 bits, which can represent any of 16 states, and only 8 values	Modify the Signal field code assignments so that all 8 of	

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
					to be represented (BPSK 1/2, BPSK 3/4, QPSK 1/2, QPSK 3/4, 16QAM 1/2, 16QAM 3/4, 64QAM 2/3, and 64QAM 3/4). This 1:2 sparseness in the code space permits the reliability of the Signal field to be improved by assigning a set of codes with a minimum Hamming distance of 2.	the assigned values are separated by a minimum Hamming distance of 2.	
4	1.3.3.6	MIF	E	no	The term "bit stuffing" is generally used to refer to the insertion of bits (often in a selective or data-pattern-dependent manner) within an SDU as part of the processess of creating a PDU. A typical example is the run-length based bit stuffing used in HDLC. This clause discusses addition of trailing zero bits to make the total PPDU length occupy an integral number of symbols. This process is generally called "padding" not "bit stuffing."	Change the title of this clause to "Padding" and update all instances of "bit stuffing" to "padding" and instances of "stuffed bits" to "pad bits."	
5	1.4.2 table 13 & A.4.8 OF1.2, OF2.11, OF2.13 OF9.3	MIF	T	YES	dot11SupportedDataRatesTxValue and dot11SupportedDataRatesRxValue are both listed with "optional rates TBD", whereas in the PICS (A.4.8, OF1.2) ALL of the data rates are optional. Similarly, in A.4.8, OF2.11 ALL of the coding rates are optional, and in A.4.8, OF2.13 ALL of the modulation mappings are optional.	Define the mandatory and optional data rates. Make the MIB and the PICS consistent on these rates. At least one data rate, coding rate, and subcarrier modulation mapping set must be mandatory, presumably {6Mbit/s, R=1/2, BPSK}.	
6	A.4.8 OF3.3	MIF	E	no	The reference, status, and support columns are blank after OF3.3. Because all of the subitems OF3.3.1 through OF 3.3.3 are optional, but some channelization is required, the top-level entry OF3.3 itself should be mandatory, just as is done for the top-level entries OF2.10, OF2.13, etc.	Add "1.3.6.3" in the References column, add "M" in the Status column, and add "Yes / No" with checkboxes in the Support column. Also, delete or clarify the ".3" following each of the	

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
						"O" entries under Status for OF3.3.1 through OF 3.3.3.	
7	1.2.2.3	MIF	e	no	"should be reserved" is poor standardese.	change "should be" to "are"	
1	1.1	mw	e		(page 2, line 9) Should Figure 11 really be Figure 10?	Consider changing figure number.	
2	1.3.1.1	mw	e		Components are presented in the equations which are not defined. See Eqs. 1,2,3.	Add a verbal description and/or figure to explain the meaning of various equation components.	
3	1.3.1.1	mw	E		In Figure 1, why is $T = Tguard + 2Tfft$? Why is it not $T = Tguard + Tfft$? T is not defined in Table 4.	Explain meaning of T formulation. Add to Table 4?	
4	1.3.3.1	mw	e		(page 10, line 29) t1 to t11 is mentioned, but Figure 4 shows only t1 to t10.	Fix discrepancy.	
5	1.3.3.2	mw	e		Wording is confusing in first paragraph. Bit encoding is obscure.	Consider adding a sentence after the first sentence which states that 2 bits of data are sent on the first OFDM training symbol and 2 bits of data are sent on the second OFDM training symbol for a total of 4 bits. For robustness, on a particular OFDM training symbol the 2 bits are encoded as an identical QPSK phase (1-of-4 phases) on all the carriers.	
6	1.3.3.4	mw	e		(page 12, line 38) Is the correct clause number used? 12.3.5.4?	Consider changing clause number.	
7	1.3.3.5	mw	e		Figure 5 has a problem with the direction of the arrowheads. One or more must be pointing in the wrong direction.	Fix CRC feedback connections in Figure 5.	
8	1.3.3.6	mw	e		Should values in Equation 14 and 15 be added to Table 4?	Consider adding parameters to the table.	
9	1.3.3.7	mw	t		Should the scrambler be put in a known, specified state?	If the scrambler is put in a known state in the	

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
						transmitter and known descrambler state in the receiver, one of two improvements arise. Receiver descrambler synchronization is not required. (1) The preamble could be shortened, since overhead is not required for scrambler synchronizing. Or, (2) Preamble detection is much more robust because the transmitter pattern is certain. The detection can be made without using the descrambler.	
10	1.3.3.10	mw	e		(page 17, line 7) Equation 17 may be ambiguous.	Consider adding an input/output table.	
11	1.3.3.13	mw	E		Are the indices in Equation 18 correct? Should the index on the right be Ns x K + n, instead of k + Ns x n?	Consider changing. Consider giving example input/output values.	
12	1.3.4	mw	t	Y	If 802.11 DSSS 1 and 2 Mbps uses a threshold specification on the ED method of CCA, why does not the 5 GHz OFDM? There are different power levels specified in Table 11. How does this impact CCA? Could interference be a problem? How is the threshold governed?	Justify CCA scheme and contrast to 2.4 GHz DSSS 1 and 2 Mbps spec.	
13	1.3.6.6	mw	t	Y	What implementation constraints are required by the 6 usec slot time?	Justify the slot time duration.	
14	1.3.7.2	mw	e		Two curves are shown in Fig. 12. What are they?	Label curves.	

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
15	1.3.7.4	mw	t		**Should the timing and carrier reference have the same source, so synchronizing on one provides synchronization on the second?**	**Consider using same clock source.**	
16	1.3.7.5	mw	t		**Should the timing and carrier reference have the same source, so synchronizing on one provides synchronization on the second?**	**Consider using same clock source.**	
17	1.3.7.6	mw	e		**Wording of this section needs improvement. Currently the test method is given before the specification values.**	**Present the specification values up front. Put the test method in a separate following paragraph.**	
18	1.3.7.6.2	mw	t	Y	**TBD used.**	**Remove TBD.**	
19	1.3.8.2	mw	t	Y	**TBD used.**	**Remove TBD.**	
20	1.3.8.3	mw	t	Y	**TBD used.**	**Remove TBD.**	
21	1.3.8.4	mw	t	Y	**TBD used.**	**Remove TBD.**	
22	1.3.8.5	mw	t	Y	**What is the purpose of the absolute accuracy? What is the impact of the 12 dB uncertainty? Should the threshold be set relative to the noise floor?**	**Describe motivation for the specification.**	
1	1.3.1.1	<mark>rw</mark>	t	Y	It can be shown that the time domain windowing included in the definitions introduces error at an ideal demodulator. This can potentially cause biased frequency and timing estimates and additionally result in degraded modulation error measurements (clause 1.3.7.6). Since the windowing is intended only to be informational, and to be more in alignment with BRAN which has no windowing, it is recommended that the artificial windowing suggested be removed. In conjunction with this, equation 5 must be changed.	**Change definition to indicate rectangular windows by either suitable change to equation 4 or by including with defining equation the time interval over which the equation is valid**	
2	1.3.1.1	<mark>rw</mark>	E	N	Equation 2 includes both the preamble and signaling separately. Since, signaling is included in the preamble per Table4 , duplication results.	**Change equation 2 rather than table 4, as**	

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4	1.3.7.6.2	**rw**	t	N	TBDs need to be removed. Has relaxed requirement on outer carriers been factored into modulation error measurement requirements?	**Technical discussion during Jan 99 meeting should suggest values**	
5	1.3.3.1	**rw**	T	Y	The Bran meeting Dec 11, 1998 in Helsinki expressed concern that a short preamble of 16 points was insufficient in length for acquisition in several of their multipath channels. No correlation peaks were discernable.	**Resolve issue in Jan 99 meeting and in concert with Bran concerns**	
6	1.3.7.6	**rw**	e	N	Equation 22, definition of "P_o" is required		
1	1.3	mbs	T	YES	**This section is written in an incomprehensible fashion. There are variables that are not defined, e.g. rDATA, wTSUBFRAME, etc. The output of Figure 2 is no labeled, much less explained. It is extremely important for this section to describe the encoder in a standard format that is easily understood, otherwise we will have compatibility problems down the road.**	**The authors/proposers of this modulation should write this section in a standard format that is easily understood, well defined and not ambiguous.**	
1	TOC	nc	e		Add Table of Contents. Set the number of levels listed in the Table of Content to 4 or 5. Many important items will be difficult to locate unless this is done.		
2	1.1, 1.4.2, A.4.8	nc	T	Y	No Mandatory data rates are stated in the standard. Such rates are required to form a "Basic Rate Set" to ensure interoperability.	Specify 12 Mbit/s and 24 Mbit/s as the Mandatory data rates.	
3	1.3.3.1	nc	E		On the line preceding equation (10), change "three repetitions" with "single repetition"		
4	1.3.6.3	nc	e		On line 7, change "may have to amplified" to "may have to be amplified"		
5	1.3.8.2	nc	t		No maximum receiver input level specified	Specify –20 dBm.	
6	1.3.8.3	nc	t		No Receiver Adjacent Channel Rejection specified		
7	1.3.8.4	nc	t		No Receiver Non-adjacent Channel Rejection specified		
8		bran			Comments by Ericsson & Nokia: The short sequence part of the 802.11a, with 0.8	Change to preamble with short preambles of 1.6 microsecond	

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					microsecond periodicity is too short for reliable detection	duration. See document 802.11-99/002	
9		bran			Instead of using 3 pilots which are inserted instead of data subcarriers, use 4 pilots which are in addition to the 48 subcarriers.		
10		bran			Add a 4 Mbit/s data rate based on BPSK and coding rate 1/3, derived from R=1/2 by repetition		
11		bran			Add a 27 Mbit/s data rate based on 16QAM and coding rate 9/16, derived from R=1/2 by puncturing		
12		bran			Prefer to have timing and carrier frequency derived from same referrence.		
13		bran			Ken Paterson (HP) would like to present a peak to average reduction technique		
1	1.3.3.1	TT	E		Reference to t11 is not correct.	On line 29 change t11 to t10.	
2	1.3.3.6	TT	t	N	Since bit stuffing is being done by the PHY, does this not affect the duration calculation of the MAC? The MAC will calculate and round up to the nearest microsecond. However with this PHY it sounds like it has to round up to the nearest 4 usec. in order to be accurate. Since an error in the duration field less than DIFS will not affect the performance or behaviour of the MAC it is probably not necessary to provide a mechanism for the MAC to calculate a number accurately. However a note should be made in this section indicating that an error of up to 9 usec. may be present in duration calculations made by the MAC. (9 comes from duration calcualtions in a fragment burst case where	Add statement that MAC duration can be up to 9 usec. less than actual duration of transmissions.	

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					the duration covers three separate frames of maximum error of 3 usec each.		
3	1.5.1	TT	t	Y	Table 14 – aMPDUDuratinFactor is not correct. The way this is defined assumes duration factor is used to convert from the PHY coding rate, e.g. at 12 Mbit/s coding rate using a ½ code you would need to multiply your duration by 2. However duration factor is used by the MAC, which takes the number of bytes multiplies it by the rate and then by the duration factor. Since the MAC is using the 6,9,12... rates which are actual data rates then the duration factor should be just 1. **Part 2**	Change aMPDUDurationFactor to be 1 for all data rates.	
1		RvN	T	yes	The numbers for slot time and SIFS are too small. These numbers are mainly dependent on processing delays in transmitter and receiver. Practical delays for the receiver are: Serial-to-parallel conversion: 4 ms FFT: 4 ms Channel correction, phase tracking, QAM to binary and deinterleaving: 5 ms Decoding: 1 ms This gives a SIFS=Rx delay + RxTxTurnaround + MACdelay = 14+3+2 = 19 ms SlotTime =	Change parameters to following values: aSlotTime = 9 ms aSIFSTime = 19 ms aRxTxTurnaroundTime < 3 ms aTxPLCPDelay : implementation dependent aRxPLCPDelay : implementation dependent aTxRampOnTime : implementation dependent aTxRampOffTime :	

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					CCATime+RxTxTurnaround+MACdelay = 4+3+2 = 9 ms RxTxTurnaroundTime = 9 ms in current draft text, probably under the assumption that an IFFT has to be performed in the transmitter. However, the transmitter can start sending the fixed preamble without almost any processing delay, so RxTxTurnaround is mainly determined by ramp-up time. Preamblelength does not take into account the Signal field, which should be included according to the definition of the preamble on page 9-11.	implementation dependent aTxRFDelay : implementation dependent aRxRFDelay : implementation dependent aPreambleLength : 17.6 ms	
2		RvN	T	yes	Allowed relative constellation errors (Table 12) are too stringent. For instance, at 24 Mbps, an SNR of about 10 dB is required at the FFT output for a 10% packet error. The constellation errors should be small relative to the noise, but in Table 12, it is required that the constellation errors are –24 db, i.e., 14 dB smaller than the expected noise level. This puts a large constraint on quantization, filtering and power amplifier effects in the transmitter. To me, a more reasonable value seems 6 dB below the noise level, so a relative error of –16 dB instead of –24.	Add 8 dB to all values in Table 12.	
1	1.3.3.7	ap	e		Figure 6	Insert Z^N taps in figure	
2	1.3.4	ap	T	N	Clear Channel Assessment using only RSSI	Implement a more robust ED detection scheme if carrier sensing is not practical.	CCA is based upon RSSI energy detection (ED). This is a simple mechanism for deferral.
1	Title page and footers	vz	E		Copyright statements have to give the year correctly	In the Draft Copyright Statement on the title page and on the bottom of each page, change 1998 to

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						1999.	
2	general	vz	E			Please include editor's notes to show how this supplement will be folded into the base standard in the future. Also, renumber clause 1 (OFDM Physical Layer Specification for the 5 GHz Band) to the proper clause number corresponding to the base standard. Should this be Clause 17	
3	Title	vz	E		Ensure that the title matches the PAR		**Checked by Vic: This is OK**
4	Abstract	vz	E		The abstract is unclear.	Please rework. Also, keywords should be listed in alphabetical order	
5	General	vz	E		Refer to clauses and subclauses. Examples: See Clause 4, see 2.3.1. Also, refer to annexes rather than appendixes.		
6	Figures	vz	E		All figures should use a minimum 8 pt type and Helvetica (medium, not bold) is the preferred font. The callouts in Figure 4 are much too small. Try to use fonts and sizes consistently in all figures (e.g., Figure 10).		
7	Tables	vz	E		Please insert an em-dash in all empty table cells to show that they are intentionally blank and that data is not missing (e.g., Table 5, Table 15).		
8	Figure 8 and 18	vz	E		Use hatching rather than grey-scale for figures when possible (e.g., Figure 8 and Figure 18).		
9	Figure 14 and	vz	E		Can callouts be switched so they are right-reading in Figures 14 and 16?		

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
	16						
10	**1.4.1; 1.4.2; elsewhere**	vz	E		Refer to the "base standard" or "IEEE Std 802.11-1997" rather than the "current standard" in 1.4.1, 1.4.2, and elsewhere.		
11	**General**	Vz	E		Lowercase clause and subclause headings wherever possible. Only the first letter of the first word should be capitalized (e.g., 1.5.5.4.4 Effect of receipt).		
12	**Font**	Vz	E		Ensure that Annex B type size is at least 8 pt		
13	**General**	Vz	E		The material in Annex C belongs in the front of the supplement. Label it as Clause 4 and add an editor's note to add the following abbreviations and acronyms to the base standard		
1	**A.4.3**	vh	E		Coordinate the item number of the 5 GHz option and the clause number with TGb.	It is more elegant if the sequence of item numbers match the sequence of clauses	
2	**A.4.8 CF6**	vh	E		The question: "Which requirements and options does the PHY support?" does not make sense.	Replace "requirements" by "functions".	
3	**A.4.8 OF2.11**	vh	T	Y	Item OF2.11 is a mandatory encoding, but the following options are all optional. If there are other encoding, not mentioned in the list, it is OK, because that encoding would be the interoperable encoding. If it is not, we have an interoperability problem.	Specify a mandatory encoding for interoperability, or make the options so that the vendor is obliged to select one and make a mechanism to resolve interoperability.	
4	**A.4.8 OF1.2**	vh	T	Y	Can a vendor make a compliant implementation if he picks neither of the optional data rate? What if one picks one and another picks a differing rate?	Make sure one is to be selected and make sure one or more are manadatory so interoperability can be warranted.	
5	**A.4.8 OF2.1.3**	vh	T	Y	Is not the modulation related to the data rate?	Specify in a way so that interdependency is made	

Seq. #	Clause number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
					clear.		
6	1.1	VH	E		The scope given here is the scope of the PHY. However, it spells "describes", where "specifies" may be better. It may be better to make an additional scope for the document first, which may have to be equal to the scope specified in the PAR. The Chair of 802.11 needs to verify the need.	Propose to make a new scope belonging to the supplement book that could look like the following: This supplement specifies the Physical Layer Entity for an Orthogonal Frequency Division Multiplexing (OFDM) system and the changes that have to be made to the base standard to accommodate the OFDM PHY.	
7	General	vh	T and E	Y	I suspect that the supplement should also add to the clauses about references, definitions, clause 12 and 13.	Review and add where needed	