IEEE P802.11
Wireless LANs

TGa November Comments Processed

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Author: Naftali Chayat
BreezeCOM
e-Mail: naftalic@breezecom.co.il

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1	**1.2.2 table 1, 1.2.3 table 2, 1.3.5 1.3.6.1 table 4, 1.3.8.1, 1.3.8.3, 1.3.8.4,**	**NC**	**E**		**Use consistent numbering order for the rates. Using 54 downto 6 has a marketing-type flavour, which is inappropriate for a technical document. Moreover, starting at 6 and culminating at 54 achieves same impact.** **Same consistency requirement for listing the order of modulations (BPSK to 64QAM) and rates (1/2, 2/3 and 3/4).**	**See text suggestions for the next item**	

2	**1.1, 1.2.2 table 1, 1.2.3 table 2, 1.3.6, 1.3.6.1 table 4, 1.3.7.5. 3 table 8, 1.3.8.1, 1.3.8.3, 1.3.8.4,**	**NC**	**T**		**Add 9 Mbit/s rate using BPSK modulation and R=3/4 coding. The gap between 6 and 12 is the largest relative gap between the supported rates, and it is natural fo fill it with another possibility for rate/performance compromise.** **The text corrections incorporate the consistent ordering of rates.**	in 1.1: … capabilities of 6, 9, 12, 18, 24, 36, 48 and 54 Mbit/s. in tables 1 and 2: 6, 9, 12, 18, 24, 36, 48 and 54 Table 3: see accompanying doc. in 1.3.6: The following clauses provide general specifications for the BPSK-OFDM, QPSK-OFDM, 16-QAM-OFDM and 64-QAM Physical Medium Dependent sublayer. Table 4: see accompanying doc. Table 8: see accompanying doc. in 1.3.8.1: The Packet Error Rate (PER) shall be less than 10% at an MPDU length of 1000 bytes for an input level of –84 dBm for 6 Mbit/s, –XX dBm for 9 Mbit/s, –81 dBm for 12 Mbit/s, –78 dBm for 18 Mbit/s, –76 dBm for 24 Mbit/s, –72 dBm for 36 Mbit/s, -XX dBm for 48 Mbit/s and –XX dBm for 54 Mbit/s, measured at the antenna connector. (NF (Noise Figure) of 10 dB and 5 dB implementation margins are assumed)	**Moved (Richard Van Nee/Hitoshi):** **To add the 9 Mbit/s rate to the list of supported rates, utilizing BPSK modulation and R=3/4 convolutional encoding.** **12/0/0 carries**

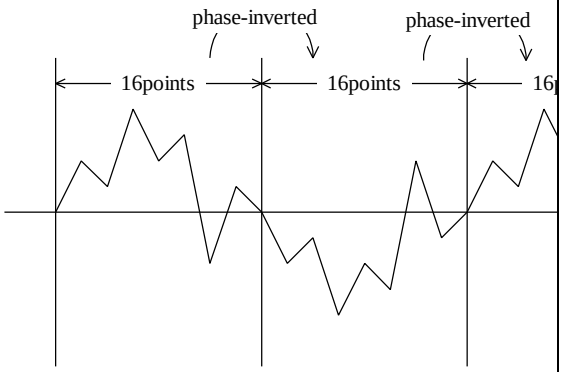
					Continued	in 1.3.8.3: The adjacent channel rejection shall be equal to or better than XX dB for 6 Mbit/s, XX dB for 9 Mbit/s, XX dB for 12 Mbit/s, XX dBm for 18 Mbit/s, XX dB for 24 Mbit/s, XX dB for 36 Mbit/s, XX dB for 48 Mbit/s and XX dB for 54 Mbit/s, with a PER of 10% at a MPDU length of 1000 bytes. in 1.3.8.4: The non-adjacent channel rejection shall be equal to or better than XX dB for 6 Mbit/s, XX dB for 9 Mbit/s, XX dB for 12 Mbit/s, XX dBm for 18 Mbit/s, XX dB for 24 Mbit/s, XX dB for 36 Mbit/s, XX dB for 48 Mbit/s and XX dB for 54 Mbit/s, with a PER of 10% at a MPDU length of 1000 bytes. in table 12, aPLCPHeaderLength: X µs (for 6 Mbit/s) X µs (for 9 Mbit/s) X µs (for 12 Mbit/s) etc. in table 12, aSupportedDataRatesTx and aSupportedDataRatesRx: 6, 9, 12, 18, 24, 36, 48, 54 Mbit/s in table 12, aMPDUDurationFactor: 4/3 (for 9, 18, 36, 54 Mbit/s)	

3	**1.3.2**	**NC**	**T**		Describe signal encoding process flow in a sinle, unfragmented manner, for example as a pseudocode. This will ease significantly the understanding of the logic of the encoding process.	**see ptopsed texts in section 1.3.2.1, "**Overview of the encoding process"	**Motion (Hitoshi/Masahiro) : To add text destribing the PPDU encoding process as a section 1.3.2.1, with the possibility to ammend its contents according to the decisions to amend other sections of the Draft. 6/0/1**
4	**1.3.3.1**	**NC**	**T**		Use sqrt(2) as the normalizing factor in S equation (1) and sqrt(0.5) in the K equation (second 3) to normalize the average power.		**Accepted**
5	**1.3.3.1**	**NC**	**T**		Use of time windowing: add a note saying that the time domain windowing is just one way to achieve the spectral mask and modulation accuracy objectives, but the implementor may use other methods to achieve same goal, such as frequency domain filtering.	Note: The binding requirements are the spectral mask and modulation accuracy requirements. Time domain windowing, as described here, is just one way to achieve those objectives. The implementor may use other methods to achieve same goal, such as frequency domain filtering.	
7	**1.3.3.1**	**NC**	**T**		Align line notation between Header and Data portions. I recommend to use the following notation to denote that the vectors rescrive amplitudes of spectral lines –24 to +24: $S_{-24:24}$, $K_{-24:24}$, In addition, incorporate the short sequence structure proposed by Tal Kaitz in Sep 98, with specific sequence proposed by Richard Van Nee.	$S_{-24:24}$ =√2*{1+j, 0, 0, 0, 1+j, 0, 0, 0, -1-j, 0, 0, 0, –1-j, 0, 0, 0, 1-j, 0, 0, 0, -1-j, 0, 0, 0, **0**, 0, 0, 0, 1+j, 0, 0, 0, 1+j, 0, 0, 0, –1-j, 0, 0, 0, 1+j, 0, 0, 0, –1+j, 0, 0, 0, 1+j} $K_{-24:24}$={1+j, –1+j, 1+j, 1+j, 1+j, -1-j, 1+j, -1+j, 1+j, -1-j, -1-j, 1+j, 1+j, -1+j, 1+j, 1+j, 1+j, -1-j, -1-j, 1-j, -1-j, 1+j, 1+j, -1-j, 0, –1+j, 1+j, 1+j, 1+j, -1-j, 1+j, -1+j, 1+j, -1-j, -1-j, 1+j, -1-j, 1-j, -1-j, -1-j, -1-j, 1+j, 1+j, -1+j, 1+j, -1-j, -1-j, 1+j, 1+j}/√2	**use capital L instead of K for the Long vector**

8					Introduce mapping function – symbol number I (in the 0..47 range) to line number M(I) (in the –24 to 24 range, 0 skipped) M(I) =I-24, 0<=I<24 M(I) = I-23 24<=I<=47	see text proposed in 1.3.6.6	
9	**1.3.3.1**	**NC**	**T**		The conversion to FFT line numbers should be an informational note. Correct figure 9 so that line #-24 maps to FFT input 40, not 41.	**see text proposed in 1.3.1**	
10	**1.3.3.1**	**NC**	**T**		In all formulae use complex baseband notation instead of carrier based notation; The inclusion of the carrier frequency in each of the formulae describing the different subsection, as described, may create a phase shift between the differend subsection The carrier frequency contribution will be described in a separate paragraph following the introduction 1.3.1. Also, amend formula (7), which describes the whole packet waveform from individual frames to include the header and convert from complex baseband to carrier notation;	see proposed text doc	**retain the concatenation description by formula in 1.3.3.6, but align notation with rest of the doc.**
11	**1.3.3.1**	**NC**	**T**		Amend formula (7), which describes the whole packet waveform from individual frames to include the header and convert from complex baseband to carrier notation;		
12	**1.3.3.1**	**NC**	**T**		Introduce a variable-length (parameter T) windowing function. By doing this the description of short training symbol section, long training symbol section, short modulated symbols and OFDM symbols in same notation even though they differe in length. By changing the definition of the windowing function so that the center of the transition, rather than its beginning, are aligned with beginning and end of the window, we become neutral to increase or decrease of the transition time.	**See Text proposed im 1.3.1**	

13	**1.3.3.1**	**NC**	**T**		Sampled time representation is informational.		**Retain the discrete time description of the windowing function; place it in the informational part after the windoing function introduction as an informational description.**
14	1.3.7.4	**NC**	**T**		Change the wording to represent the motion on ck-carrier accuracy separation.		
15	1.3.3.6	**NC**	**T**		Scrambler – add note that the specific sequence corresponds to “all ones” initial state. In the drawing, change “Initialize all registers with ones” into “initialize to pseudorandom non-all-zeros state” or withdraw.		**Accepted**
16	**1.3.3.1**	**NC**	**T**		The rate signaling by two QPSK symbols each modulating a short sequence is less robust in multipath than the data with BRSK at R=1/2, i.e. at 6 Mbit/s. To resolve this, we propose a header based on BPSK, R=1/2 signaling, conveying 24 bits. we propose to use a tail-biting convolutional code for this frame.	**see details in an accompanying doc 98/369.**	
17	**1.3.3.1**	**NC**	**T**		p.9 update 6+5 to 7+5 short sequences, the T1 and T2 into one long repetitive symbol, and update drawing.		
18	**1.3.3.2**	**NC**	**T**		Describe unambiguously QPSK phases for rate signaling; add windowing definition for each of the short sequences used for QPSK signaling.		
19	**1.3.3.1**	**NC**	**E**		“Tail bits” for the convolutional encoder and the “Stuff bits” should be included in the PPDU destription in Figure 1.	**Modify Figure 1 accordingly**	

20	1.3.3.9.	**NC**	**T**		The "Stuff bits" should be described as "pseudo-random". If those bits are left as zeros and are not scrambled, a large time domain overshoot may result. The possibility to generate them by passing an all-zero stream through the scrambler can be mentioned or enforced.		**Motion(Richard/Hitoshi):** **That the stuff bits will be generated by appending zero bits to the uncoded data bits, and then scrambling, replacing tail bits with unscrambled zeros and convolutionally encoding will be applied to the resulting data stream** **7/0/0**
21	**1.3.8.1**	**NC**	**T**		insert Sensitivity numbers where missing		
22	**1.3.7.5.3**	**NC**	**T**		Modulation Accuracy numbers		
23	**1.3.7.6**	**NC**	**E**		Ck accuracy should be immediately after the 1.3.7.4, Center frequency accuracy		
							Motion (Hitoshi/Masahiro) **Approve text changes related to NC comments 1-15, 17-20 as proposed in doc 98/370a as amended during Tue afternoon session.** **6/0/0**

	1.3.3.1	KO	T		Definition of short training symbol (Technical) Draft says that "By applying a 64 point IFFT to the vector S where the remaining 15 values are set to zero – four short training symbols can be produced. The IFFT output is cyclic extended to make six short symbols". When vector S in equation (1) is fed to a 64 point IFFT, the output is composed by four phase-inverted signals as shown the following figure in time domain.  It seems not be clear that which phase should be used for short training symbols. This ambiguity seems to make it difficult to define phase of short training symbols in t7-t9. Please make clear the definition of short training symbol.		**Move that(Dean/RvN):** **The modified short training sequence as proposed by Richard Van Nee and describes in the text proposed by Naftali Chayat,** $S_{-24:24} = \sqrt{2}*\{1+j, 0, 0, 0, 1+j, 0, 0, 0, -1-j, 0, 0, 0, -1-j, 0, 0, 0, 1-j, 0, 0, 0, -1-j, 0, 0, 0, \mathbf{0}, 0, 0, 0, 1+j, 0, 0, 0, 1+j, 0, 0, 0, -1-j, 0, 0, 0, 1+j, 0, 0, 0, -1+j, 0, 0, 0, 1+j\}$ **be accepted as a replacement of the previous version of the short preamble.** **10/0/3 carries**
		KO	E		The equation (3) seems to be changed to the following equation $$w(n) = \begin{cases} 0 & n = 0,82 \\ 0.5 & n = 1,81 \\ 1 & 2 \le n \le 80 \end{cases},$$ because $t=t_s$ and $t=t_s+T_t+??$ are defined in a upper equation in (2).		
		KO	T		Fig.2 Training Structure (Technical) We could find no window function for short training symbols t7-t11. Is it OK?		

	1.3.3.8	**KO**	**E**		Convolutional Encoder Fig.5 Convolutional Encoder (K=7) (Editorial) In this figure, connected points and crossing points are not clear.		
	1.3.3.8	**KO**	**E**		Fig.6 An example of bit-stealing and bit-insertion procedure (r=3/4, 2/3) (Editorial) In Fig. 5 and Fig.6, relationships Output data A/B in Fig. 5 and I_n/Q_n (n=0,1,2,…) in Fig. 6 are not clear.		**Replace letters I and Q in figur 6 by A and B correspondingly, so that all data rates will be addressed and not only QPSK.**
	1.3.6.5	**KO**	**E**		Bit Assignment First sentence (Editorial) Draft says that "Source data stream is divided into 48 sets and the data sets…". However, considering the insertion of 3 pilot symbols, the "Source data stream" seems to be divided into 45 sets.		
	1.3.6.5	**KO**	**E**		Fig.9 Inputs and outputs of IDFT (Editorial) In Fig.9, it seems that 40^{th} input port of IDFT corresponds to carrier #-24.		**Correct. To be treated editorially.**
	1.3.6.6	**KO**	**E**		Modulation Equation (8) (Editorial) The equation (8) seems to be changed to the following equation $$w(n) = \begin{cases} 0 & n = 0,82 \\ 0.5 & n = 1,81 \\ 1 & 2 \le n \le 80 \end{cases},$$ because $t=t_s$ and $t=t_s+T+T_{prefix}+T_{postfix}$ are defined in a upper equation in (6).		
1	**Front page**	**VH**	**E**	**N**	**P802.11a/D1.4 ought to be right aligned**	**Check template and move**	
2	**Front Page**	**VH**	**E**	**N**	**Second line seems not to be according to template**	**Check template and fill in Supplement to IEEE Std 802.11-1997**	
3	**Front page**	**VH**	**E**	**N**	**"Sponsored by" should be "Sponsor"**	**Change accordingly**	
4	**General**	**VH**	**E**	**N**	**It is hard to point to certain text if there are no line numbers mentioned**	**Include line numbers**	

5	**General**	**VH**	**E**	**N**	**All replaced text should be in strike-through text, new text should be underlined and changes must be marked in the margin by a line A document Dx.0 is always a document without revision marks. The editor uses the revision marks feature through the various versions. To keep track of versions made available during the meetings, he uses versions Dx.0L where the L is an a, b, c ….. As soon as the editor has done his job, he will make a version Dx.# where # is a number 1, 2, 3,…. And that document will go on the web. If at a next meeting, there will be another set of changes, the editor will use the versionhs Dx.1L. If a letter ballot is started, he will also make a version without revsion marks which will have the version Dx+1.0.**	**Please implement this feature**	
6	**Participants**	**VH**	**E**	**N**	**This section will be completed by the IEEE editor at the time of publication readiness work. It will contain all those that were Voting member at the approval meeting to start Sponsor ballot extended with those that made extended contributions**	**Remove all the names from the draft**	
7	**General**	**VH**	**E**	**N**	**The headers do not look properly made**	**Check the following proposal with the IEEE editor:** **On left hand side pages:** **First line: IEEE** **Second line:** P802.11a/D1.4-Nov 98 DRAFT SUPPLEMENT TO STANDARD FOR LAN/MAN PART 11: MAC & PHY SPECIFICATIONS: **On right hand side pages:** **First line (right justified) IEEE** **Second line:** HIGH SPEED PHYSICAL LAYER IN THE 5 GHz BAND P802.11a/D1.0-Nov 98	
8	**General**	**VH**	**E**	**N**	**Not all formulas may be in accordance with the IEEE rules**	**Check globally for the following: All VARIABLES in formulas in italic text, all constants in normal text**	

9	General	VH	E	N	This standard is a supplement to the existing standard and should therefore contain instructions to changes to be made to the clauses from the main standard	Add the following clauses: Definitions, Abbreviations and acronyms, Physical Layer service specification (if needed), PHY managament, Protocol Implementaion Conformance Statement Proforma, ASN1 encoding of the MAC and PHY MIB	
10	Annex A	VH	T	Y	There is no PICS Proforma. This clause is needed to define which functions are mandatory and which are optional (or mandatory in case an option is implemented)	Add a PICS Proforma	
11	Fig 8	VH	T	N	According to the FCC regulation, the upper bound frequency band is in 5725 - 5825 MHz.	Specified frequencies in Fig. 8 shall be shifted by -50 MHz	

Seq. #	Section number	your voter's id code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal