Cl **XX** *SC* *P* *L* # **2**

Bob O'Hara

Comment Type **T** *Comment Status* **X**

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **XX** *SC* **0** *P* **1** *L* # **63**

Valerie E. Zelenty IEEE Standards Dept.

Comment Type **E** *Comment Status* **X**

Title is incorrect.

SuggestedRemedy

Match title to published 802.11-1997.
You left out "LAN" after the word "Wireless"
and also left out "Information technology."
This is minor and can be corrected at time of
publication by the IEEE editor.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.1** *P* **8** *L* **13** # **3**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

"should be" is not proper usage in a standard. Correct usage is either descriptive or normative.

SuggestedRemedy

If this is the statement of which rates are required, replace "should" with "shall". If this is merely descriptive as is appropriate for an introductory clause, replace "should be" with "are".

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.1** *P* **8** *L* **13** # **4**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

Wrong verb

SuggestedRemedy

replace "is" with "are"

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.1** *P* **8** *L* **8** # **5**

Satoshi Obara Fujitsu

Comment Type **E** *Comment Status* **X**

"supplement" is wrong word.

SuggestedRemedy

"supplement" should be change "clause".

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.12** *P* **40** *L* **30** # **6**

Richard van Nee Lucent Technologies

Comment Type **E** *Comment Status* **X**

In 17.3.12, line 30, it is stated that 'if the
PLCP header is successful, but the CRC is not valid...Also, in
this case, the CCA shall idicate busy ...as indicated by the
LENGTH field'
First, there is no CRC anymore. Second, it does not seem to make
much sense to use the LENGTH field when the header is wrong.

SuggestedRemedy

Replace 'but the CRC of the PLCP header is not valid' by 'but
the parity check of the PLCP header fails'
Remove the two last sentences 'Also, in this case ... Length
field. The intended duration is indicated by the Length field.'

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **17.3.12**

Cl **XX** *SC* **17.3.2** *P* **11** *L* **18** # **7**

David Skellern Radiata Communicati

Comment Type **T** *Comment Status* **X**

Section 17.3.2 PLCP frame format
The PLCP frame changed dramatically between Draft 2.0 and Draft 3.1.

Draft 2.0 defined the SIGNAL field as 2 short sequences each QPSK modulated by a pair of bits to convey the 4 bit RATE information. This system has the advantage that it is robust and the RATE information can be recovered from the receive PDU before demodulation and decoding of the PLCP header and MPDU has commenced.

In Draft 3.1 the SIGNAL field was re-defined as shown in Figure 107 of Draft 5.0. The rate information was moved into the PLCP header which is defined to be rate1/2 BPSK coded OFDM. This scheme has a serious implementation problem. De-interleaving, demodulation, and decoding of the SERVICE field and PSDU (i.e. data portion of the packet) cannot commence until the RATE information has been extracted, as the information in this field (i.e. modulation type and FEC coding rate) affects the set-up of the de-interleaver, demodulator and Viterbi decoder. However the total latency through the de-interleaver, FFT, and Viterbi decoder will be of the order of 100 clock cycles, requiring buffering of the receive chain until the RATE information has successfully been extracted. A 100 deep I/Q FIFO is a significant overhead, and adds considerable complexity to the receive chain pipeline control. The previous system, where the RATE information was available immediately, was far superior from an implementation point of view.

SuggestedRemedy

Persevering with the current system requires that the RATE information be moved to the start of the SIGNAL field. A lookup table based system could then be used to determine the modulation and coding rate without introducing significant latency into the receive chain.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.2** *P* **11** *L* **35 - 50** # **8**

Kazuhiro Okanoue NEC Corp.

Comment Type **T** *Comment Status* **X**

In the figure 107, LENGTH field is located at the first field of PLCP header. Considering receiving procedure, it is important for a receiver to adjust its configuration to modulation method in the following OFDM symbols as soon as possible. Therefore, I think it is better to replace the LENGTH field and the RATE field in PLCP header.

SuggestedRemedy

Replace the LENGTH field and the RATE field in PLCP header.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.2.1** *P* **11** *L* **16** # **9**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

missing "the" between "follows" and "steps"

SuggestedRemedy

insert "the"

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.2.1** *P* **11** *L* **24** # **10**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

The PHY does not know the content of the PSDU and, thus, can not know there is a CRC-32 as part of the PSDU.

SuggestedRemedy

Delete the parenthetical clause.

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **17.3.2.1**

Cl **XX** *SC* **17.3.2.1** *P* **11** *L* **8** # **11**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

The wording of "with a Guard Interval in front" is confusing. In front of what?

SuggestedRemedy

Reword the sentence using "sparated from the short training sequence by a Guard Interval".

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.2.1** *P* **12** *L* **51** # **12**

Bob O'Hara Informed Technology.

Comment Type **E** *Comment Status* **X**

Each of the other items in this list refers to a subclause for the technical detail summarized by eacch list item. Item 10 does not include such a reference.

SuggestedRemedy

Include the appropriate reference for technical detail in item 10.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.2.2** *P* **13** *L* **various** # **13**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

Is the content of Table 78 normative? If so, then there needs to be a "shall" statement in this clause. If not, is there a normative statement that states, for example, that "when transmitting at 6 Mb/s, the modulation used shall be BPSK" for each of the items in the table?

SuggestedRemedy

Make the table normative.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.2.4** *P* **13** *L* **51** # **14**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

Missing a word.

SuggestedRemedy

Insert "a" between "of" and "complex".

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.2.4** *P* **15** *L* **21** # **15**

Vic Hayes Lucent Technologies

Comment Type **E** *Comment Status* **X**

symbol "nsec" is NOT an SI symbol.

SuggestedRemedy

Change "nsec" into "ns"

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.2.5** *P* **16** *L* **6** # **16**

Vic Hayes Lucent Technologies

Comment Type **E** *Comment Status* **X**

symbols " [micro]sec" and "nsec" are NOT SI symbols.

SuggestedRemedy

Change "...sec" into "...s"

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **17.3.2.5**

Cl **XX** *SC* **17.3.3** *P* **16 & 17** *L* **N/A** # **17**

Mark Webster Harris Semiconductor

Comment Type **T** *Comment Status* **X**

The current short-sync (t1-t10) does not seem to have a clear, unambiguous, end-of-pattern demarcation.

The receiver may not be detect all 10 short-sync patterns due to (1) AGC pull-in and ADC clipping , or (2) antenna diversity ping-pong with switching transients. Consequently, the receiver may be uncertain as to when the start of long-sync occurs. The loss-of-energy in the short-sync correlator when T1 onsets is not a strong indicator.

SuggestedRemedy

Possibly a clear end-of-pattern can be made for short sync (t1-t10) by phase inverting the last sync repetition (t10).

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.3** *P* **16 and 17** *L* **N/A** # **18**

Mark Webster Harris Semiconductor

Comment Type **T** *Comment Status* **X**

The 5 GHz standard should be capable of supporting antenna diversity. It is not clear that it can do so. I could not find any IEEE802.11 submissions adequately justifying the current short-sync (t1-t10) specification. (I apologize if an oversight has occurred on my part.)

The short sync portion of the PLCP lasts only 8 usec. This transient a sequence seems highly aggressive if antenna diversity is desired. Antenna diversity is a feature which most manufacturers/suppliers/end-users demand. Antenna diversity is needed to combat log-normal fading and flat Rayliegh fading. The requisite higher-SNR's needed to support very high data rates (up 54 Mbps) seems to make antenna diversity an even more important requirement. Note, the PSDU data-rate is not known until the SIGNAL field, long after a diversity decision must be made.

During the short-sync timeframe it seems necessary to

(1) Ping-pong between two antennas looking for sync/CCA, since one antenna may be in a faded condition.
(2) On signal onset, pull-in an AGC on antenna A
(3) Detect the sync pattern
(4) Evaluate a diversity metric on antenna A
(5) Switch antennas from A to B and let transients settle on antenna B
(6) Pull-in an AGC on antenna B
(7) Evaluate a diversity metric on antenna B
(4) Switch back to antenna A if it is superior and let transients settle
(5) Coarse frequency offset estimate
(6) Set-up for long-sync (T1 and T2)

Some of these tasks can be performed in parallel. The nonlinear (clipping) effects caused by the ADC and the nonlinear signal modulation by the AGC during pull-in may force certain steps to be made sequentially.

In general, a diversity metric may monitor SNR (and SIR) and the degree of multipath on the two antennas. At relatively low SNR's (SIR's), the antenna can be chosen with the best SNR. At relatively higher SNR's, the antenna can be chosen with the smallest multipath measure. To measure multipath, the multipath spread must be measured using the short-sync correlation output on each antenna.

If the antennas are ping-pong'd (switched back and forth) looking for signal, say every 4 usec, until a acquisition hit is made, one or more short sync's may be lost (e.g., t1 thru t3).

SuggestedRemedy

Please produce a IEEE802.11a submission which justifies the current short sync timeline. Since this can vary greatly from implementation-to-implementation, it is only necessary to describe a typical timeline.

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **17.3.3**

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.3** *P* **17** *L* **?** # **19**

Mark Webster Harris Semiconductor

Comment Type **E** *Comment Status* **X**

Figure 110: Synchronize is misspelled as "synchoronize."

SuggestedRemedy

Correct spelling.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.3** *P* **17** *L* **10** # **20**

Carl Andren Harris Semiconductor

Comment Type **T** *Comment Status* **X**

There does not seem to be enough time in the sync field for proper diversity selection. The minimum data rate is 6 Mbps and the symbol size is 0.8 us, making the number of eqwuivalent bits per symbol 4.8. Normally, for any decision on a signal, you would need 15 dB of integrated energy, and at an Eb/N0 of 10 dB, this takes one solid symbol for a decision. Allow a couple of microseconds for AGC settling. With asynchronous switching of the diversity switch, it takes 2 symbols for examining each antenna. This takes up too much of the allowed 5.6 microseconds of time. Keep in mind this is all quite optimistic on switching times and settling times.

SuggestedRemedy

allow at least twice as much time for synchronization and diversity now, so the problem can be solved for those seeking to do diversity later.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.3** *P* **17** *L* **20** # **21**

Vic Hayes Luecent Technologies

Comment Type **T** *Comment Status* **X**

Comment sponsored for ETSI Project BRAN:

the sign inversion of the last short symbol (symbol S) in the PLCP preamble is another item that we would like to include in the current IEEE . The BRAN HL2 PHY group has identified the sign inverted last repetition of the short symbols is beneficial for improving timing detection accuracy, simplifying the synchronisation processing, increasing the receiver implementation flexibility (e.g. auto-correlation based or cross-correlation based) and providing unique identification possibilities of the last short symbol repetition.

SuggestedRemedy

Add the following text:
"The short OFDM training symbols t1 to t9 consists of 12 subcarriers which are modulated by the elements of the sequence S given by:
S(-26…26) = sqrt(2)*{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, 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, 0, 0.

The short OFDM training symbol t10 is a sign inverted copy of the preceding symbol t9"

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **17.3.3**

Cl **XX** *SC* **17.3.3** *P* **17** *L* **25-26** # **22**

Vic Hayes Luecent Technologies

Comment Type **T** *Comment Status* **X**

Comment sponsored for ETSI Project BRAN:

We would like to replace the symbol S(-26, 26) in the PCLP preamble of the 802.11a draft standard (on the page 17, line 25/26) with one of the symbols we used in the preamble. It is firstly for more harmonization between two physical layers and secondly has technical benefits, because the Peak-to-Average Ratio (PAPR) and the Dynamic Range of the signal used in HL2 preamble is less than that used in 802.11a.
it has a PAPR of 2.24 dB (current symbol in Draft has a PAPR of 3.01 dB) and the dynamic range is 7.01 dB (the dynamic range of current symbol is 30.82 dB).

SuggestedRemedy

The new symbol
should be

S(-26…26) = sqrt(2)*{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, 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, 0, 0}

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.3** *P* **17** *L* **39** # **23**

Vic Hayes Lucent Technologies

Comment Type **E** *Comment Status* **X**

symbols " [micro]sec" are NOT SI symbols.

SuggestedRemedy

Change 3 times "...sec" into "...s"

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.3** *P* **17** *L* **44** # **25**

MASAHIRO MORIKURA NTT

Comment Type **T** *Comment Status* **X**

The phase relation between short preamble (t1-t10) and long preamble (T1,T2) of draft 5.0 may cause degradation in timing detection. This is because the matched filter output for detecting the short preamble pattern has large sidelobe in boundary region between t10 and T1 due to the phase relation in D5.0. This large sidelobe badly affects the timing decision when multipath delayed signals are superimposed.

SuggestedRemedy

Change Eq.(8) so as to rotate the all signal phase +(3/4)pi
L={-1+j, -1+j, +1-j, +1-j, -1+j, -1+j, +1-j, -1+j, ... , -1+j,
-1+j}/sqrt(2.0)

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.3** *P* **17** *L* **44** # **26**

MASAHIRO MORIKURA NTT

Comment Type **T** *Comment Status* **X**

17.3.3 PLCP preamble (SYNC)

Comment;
The phase relation between short preamble (t1-t10) and long preamble (T1,T2) of draft 5.0 may cause degradation in timing detection. This is because the matched filter output for detecting the short preamble pattern has large sidelobe in boundary region between t10 and T1 due to the phase relation in D5.0. This large sidelobe badly affects the timing decision when multipath delayed signals are superimposed.

Recommendation;
Change Eq.(8) so as to rotate the all signal phase +(3/4)pi
L={-1+j, -1+j, +1-j, +1-j, -1+j, -1+j, +1-j, -1+j, ... , -1+j, -1+j}/sqrt(2.0)

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.3** *P* **17** *L* **44** # **24**

MASAHIRO MORIKURA NTT

Comment Type **T** *Comment Status* **X**

Comment;
The phase relation between short preamble (t1-t10) and long preamble (T1,T2) of draft 5.0 may cause degradation in timing detection. This is because the matched filter output for detecting the short preamble pattern has large sidelobe in boundary region between t10 and T1 due to the phase relation in D5.0. This large sidelobe badly affects the timing decision when multipath delayed signals are superimposed.

SuggestedRemedy

Change Eq.(8) so as to rotate the all signal phase +(3/4)pi
L={-1+j, -1+j, +1-j, +1-j, -1+j, -1+j, +1-j, -1+j, ... , -1+j, -1+j}/sqrt(2.0)

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.4** *P* **18** *L* **20** # **27**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

Figure reference is not correct.

SuggestedRemedy

Replace "112" with "111".

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.4** *P* **18** *L* **various** # **28**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

There is no normative requirement in this clause.

SuggestedRemedy

Put some "shalls" in here.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.4.3** *P* **19** *L* **1** # **29**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

Table 80: Isn't there much more information in this table than is necessary?

SuggestedRemedy

Make this table only two columns and include in column 1 the rate and in column 2 the coding for the rate. Eliminate all extraneous information from the table.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.5.1** *P* **19** *L* **45** # **30**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

The direction for order of transmission in figure 112 is opposite of that in figure 111. This may lead to confusion, even with the arrow indicating the proper direction.

SuggestedRemedy

Revise all figures showing transmission order to use the same direction, either left to right or right to left.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.5.3** *P* *L* # **31**

Bob Ward

Comment Type **T** *Comment Status* **X**

Padbits, equation 11.

SuggestedRemedy

An integer result must be achieved. Specify whether result should use the floor or the ceiling function

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **17.3.5.3**

Cl **XX** *SC* **17.3.5.3** *P* **20** *L* **13** # **32**

David Skellern Radiata Communicati

Comment Type **E** *Comment Status* **X**

Equation (11) is incorrectly written as
Nsym = (16+ 8*LENGTH + 6 + NDBPS - 1)/NDBPS)

It should in fact be the floor() if this value.

SuggestedRemedy

Change Equation 11 to be
Nsym = floor((16+ 8*LENGTH + 6 + NDBPS - 1)/NDBPS)

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.5.4** *P* **20** *L* **30** # **33**

Vic Hayes Lucent Technologies

Comment Type **T** *Comment Status* **X**

Commenter suggests that the output is a requirement, rather than a fact.

SuggestedRemedy

Replace "is" by "shall be".

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.5.5** *P* **21** *L* **5** # **34**

Vic Hayes Lucent Technologies

Comment Type **T** *Comment Status* **X**

Commenter suggests that the experts consider whether the use of octal is a) unambiguous, and b) correctly / consistently specified taking that the notation for hexadecimal is done by X'....'.
Is the notation O'....' an industry standard use?

SuggestedRemedy

Consider to specify the same way as done in Fig 111. Or use the O'..." notation.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.5.6** *P* *L* # **35**

Bob Ward

Comment Type **T** *Comment Status* **X**

Interleaving text in version 5.0 is incomplete

SuggestedRemedy

1) Described complete interleaving method, reintroducing equations from draft version 3.0
2) Include illustrations as presented at March meeting

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **17.3.5.6**

Cl **XX** *SC* **17.3.5.6** *P* **23** *L* **1** # **36**

David Skellern Radiata Communicati

Comment Type **T** *Comment Status* **X**

The specification for interleaving changed dramatically between Draft 2.0 and Draft 3.1.
Draft 2.0 specifies the mapping between the original location (k) of a bit in a block, and its final location (i) as:

$$k = 16i - (NCBPS - 1)\ floor(16i/NCBPS) \qquad i=0, 1, \ldots, NCBPS - 1$$

where NCBPS is the number of bits per OFDM symbol (formula 17, page 17 of Draft 2.0).
Note that this method provides interleaving regardless of the modulation scheme.

The current interleaving scheme, introduced in Draft 3.1, (Draft 5.0, formula 16, page 23, note that i and j are transposed in the formula) is given as:

$$k = s*floor(i/s) + (i + floor(16i/NCPBS)) \bmod s \qquad I = 0, 1, \ldots, NCBPS - 1$$

where:
$s = max (NBPSC/2, 1)$
This interleaving function results in bits being shuffled within groups of size s. This is an inferior scheme to that of Draft 2.0, especially for BPSK and QPSK modulation schemes where s = 1, resulting in an erroneous interleaving function of k = i. Also note that if 8PSK is to be supported at a later date, this would result in a fractional value of s = 1.5.

SuggestedRemedy

Return to previous interleaving method introduced in Draft 2.0.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.5.6** *P* **23** *L* **1-18** # **37**

Dean Kawaguchi Symbol Technologies,

Comment Type **T** *Comment Status* **X**

The technical description is not clear enough to ensure that implementations from different manufacturers will interoperate. There is no good reason for not making this part explicitly clear by providing the figures such as that presented in 99/075 in the March meeting.

SuggestedRemedy

Include better description or figures or both to make the interleaving algorithm explicitly clear.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.5.6** *P* **23** *L* **3 - 18** # **38**

Kazuhiro Okanoue NEC Corp.

Comment Type **T** *Comment Status* **X**

The interleaving method described in the draft is different from the method described in the document titled DOC. IEEE P802.11-99/47r1, which has been approved at March meeting.

SuggestedRemedy

Add the 1st item described in section 5.2 of doc. IEEE 802.11-99/47r1.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.5.6** *P* **23** *L* **7** # **39**

Richard van Nee Lucent Technologies

Comment Type **T** *Comment Status* **X**

The new interleaving and deinterleaving descriptions in 17.3.5.6 are not correctly modified. It should give the old interleaving and deinterleaving equations, followed by the permutation rules which are described by (15) and (16).

SuggestedRemedy

Fix the description so they match with IEEE802.11-99/047r1.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.5.7** *P* **23** *L* **23** # **40**

Vic Hayes Lucent Technologies

Comment Type **T** *Comment Status* **X**

The interleaver/de-interleaver change that was agreed upon in the March meeting, and that is described in doc 99:047r1, was not correctly incorporated into the text. In doc 47r1 the permutation was defined as a two step process whereas in drat 4.0 only one step is described.

SuggestedRemedy

Refer to document 99/47-r1 for the actual change and the actual place of the addition. In text format the tesxt is as follows:

Data interleaving
All encoded data bits shall be interleaved by a block interleaver with a block size corresponding to the num-ber of bits in a single OFDM symbol, NCBPS. The interleaver is defined by a two step permutation. The first insures that adjacent coded bits are mapped onto nonadjacent subcarriers. The second permutation insures that adjacent coded bits are mapped alternately onto less and more significant bits of the constellation, and by this long runs of low reliability (LSB) bits are avoided.
We shall denote by k the index of the coded bit before the first permutation, i shall be the index after the first and before the second permutation and j shall be the index after the second permutation, just prior to modulation mapping.
The first permutation, is defined by the rule:
i=(NCBPS/16) (k mod 16)+floor(k/16) k=0,1,…,NCBPS-1 (eq1)
The function floor(.) denotes the largest integer not exceeding the parameter.
The second permutation is defined by the rule:
j= s*floor(i/s)+ (i + NCBPS - floor(16*i/NCBPS)) mod s i=0,1,… NCPBS-1 (eq2)
The value of s is determined by the number of coded bits per subcarrier, NBPSC, according to:
s = max(NBPSC/2,1). (eq3)
The deinterleaver, which performs the inverse relation, is also defined by two permutations. Here we shall denote by j the index of the original received bit before the first permutation, i shall be the index after the first and before the second permutation and k shall be the index after the second permutation, just prior to delivering the coded bits to the convolutional (Viterbi) decoder.
The first permutation is defined by the rule:
i= s*floor(j/s)+ (j+ floor(16*j/NCBPS)) mod s j=0,1,… NCPBS-1 (eq4)
where s is defined in equation (eq3). This permutation is the inverse of the permutation described in (eq2).
The second permutation is defined by the rule:
k=16*i-(NCBPS-1)floor(16*i/NCBPS) i=0,1,… NCPBS-1 (eq5)
This permutation is the inverse of the permutation described in (eq1).

Proposed Response *Response Status* **C**

Cl **XX** *SC* **17.3.8.2** *P* *L* # **41**

Mike Trompower Telxon Corporation

Comment Type **T** *Comment Status* **X**

This section should define the parameters to be reported for aRegDomainsSupported and aCurrentRegDomain attributes according to section 13. The FCC rules for 5GHz operation are not the same for those for 2.4GHz operation. It would seem that the FCC authority here is the same as FCC (reg domain 0x10) from the other sections.

SuggestedRemedy

add to the regulatory domain lists in section 13 and to the MIB as well as to the text of section 17

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.8.2** *P* **28** *L* **various** # **42**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

This PHY specification specifies operation only in the US, not providing for operation in regulatory domains that earlier 802.11 implementations currently service. This is not acceptable.

SuggestedRemedy

Add information for additional regulatory domains where this radio band is available.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **17.3.8.3.3** *P* **31** *L* **11** # **43**

Vic Hayes Lucent Technologies

Comment Type **E** *Comment Status* **X**

The figure shows a 4 incomplete characters below "5180".

SuggestedRemedy

Correct the figure by either showing the complete characters or erase the characters.

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **17.3.8.3.3**

Cl **XX** *SC* **17.5.4.3** *P* **47, et.al** *L* **47** # **64**

Valerie E. Zelenty IEEE Standards Dept.

Comment Type **E** *Comment Status* **X**

"The following clause..." should be changed to "The following subclause..."

SuggestedRemedy

Check for each instance of the word "clause" throughout this document and see if it should be changed to "subclause."

Proposed Response *Response Status* **O**

Cl **XX** *SC* **18.1.1** *P* **10** *L* **38** # **44**

Satoshi Obara Fujitsu

Comment Type **E** *Comment Status* **X**

"supplement" is wrong word.

SuggestedRemedy

The "supplement" should be change "clause".

Proposed Response *Response Status* **O**

Cl **XX** *SC* **7.2.2** *P* **9** *L* **44** # **45**

Bob O'Hara Informed Technology.

Comment Type **E** *Comment Status* **X**

wrong verb

SuggestedRemedy

replace "is" with "are"

Proposed Response *Response Status* **O**

Cl **XX** *SC* **7.2.2** *P* **9** *L* **45** # **46**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

The description in the value column does not agree with the text in clause 17.2.2.3

SuggestedRemedy

Correct the table or the text in 17.2.2.3 to agree.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **7.2.3** *P* **10** *L* **various** # **47**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

Table 77 list four parameters of the RXVECTOR. Yet, only two parameters are described in the subclauses.

SuggestedRemedy

Add descriptive subclauses for the missing two parameters.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **9.1** *P* **10** *L* **10** # **48**

Vic Hayes Lucent Technologies

Comment Type **E** *Comment Status* **X**

What is meant with "of D4.0b"? This supplement only refers to 802.11 and not to draft 11b, if that was meant.

SuggestedRemedy

Correct the reference.

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **9.1**

Cl **XX** *SC* **A.4.3** *P* **52** *L* **24** # **49**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

Is the "High Speed PHY Layer" part of this PHY? If not, this entry should not be part of this document.

SuggestedRemedy

Remove the entry.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **A.4.8** *P* **53** *L* **12 - 22** # **50**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

There is no normative requirement stated in the referenced clause. Thus, the items here can not be mandatory.

SuggestedRemedy

Correct the referenced clause to include "shall" statements and "may" statements to make the various rates mandatory or optional.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **A.4.8** *P* **54** *L* **33 - 35** # **51**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

Since items OF3.1-OF3.3 do not appear in the status column as a predicate, they should not be preceded by a "*" in the item column.

SuggestedRemedy

Remove the "*".

Proposed Response *Response Status* **O**

Cl **XX** *SC* **A.4.8** *P* **54** *L* **36 - 38** # **53**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

Is it really the intention to require that an implementation is capable of operating in only one if the UNII sub-bands?

SuggestedRemedy

Remove the ".1" from the status column for each of the entries.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **A.4.8** *P* **54** *L* **36 - 38** # **52**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

Since each of these items (OF3.3.1 - OF3.3.3) are used as predicates in the status column (see items OF4.1.1 - OF4.1.3), they must be preceded by a "*" in the Item column.

SuggestedRemedy

Insert the "*".

Proposed Response *Response Status* **O**

Cl **XX** *SC* **A.4.8 Item OF2.15** *P* **54** *L* **11** # **54**

Bob O'Hara Informed Technology,

Comment Type **T** *Comment Status* **X**

THere is no normative requirement stated in the referenced clause. Thus, this item can not be mandatory.

SuggestedRemedy

Correct the referenced clause to include "shall", as needed, to make the required modulations mandatory.

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **A.4.8 Item OF2.15**

Cl **XX** *SC* **A4.8** *P* **54** *L* **52** # **55**

Stanley Reible MICRILOR, Inc

Comment Type **T** *Comment Status* **X**

This equipment may often be packaged with other heat dissipating hardware. Maintain a maximum ambient operating temperature of 40 degrees C may be hard to provide in such applications and limit equipment use.

SuggestedRemedy

Review temperature requirements for such high data rate products.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **A4.8** *P* **54** *L* **53** # **56**

Stanley Reible MICRILOR, Inc.

Comment Type **T** *Comment Status* **X**

An ambient temperature of -30 degrees C and lower is frequently encountered in Industrial applications.

SuggestedRemedy

Please review this specification to insure that the needs of anticipated users will be meet.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **all area** *P* **all area** *L* # **57**

Satoshi Obara Fujitsu

Comment Type **E** *Comment Status* **X**

All figure numbers and table numbers should be adjusted to base document.

SuggestedRemedy

If possible, it should be "clause number - figure(table) number". For example, if it is figure 1 in clause 18, it is "Figure 18-1".

(Similarly, the change of base document may be needed?)

In case of existing many figures and tables, it is easy for the readers to understand the 802.11.
And, other 802 standards use the above format.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **Annex A** *P* **52** *L* **5** # **58**

Vic Hayes Lucent Technologies

Comment Type **E** *Comment Status* **X**

The editor's instruction is not according to the convention.

SuggestedRemedy

Make the characters BOLD and ITALIC.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **Annex E** *P* *L* # **59**

Bob Ward

Comment Type **T** *Comment Status* **X**

· Recommend that the informative windowing be deleted in order that the example follow the normative part of the standard.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **XX** *SC* **Introduction** *P* **3** *L* **various** # **60**

Bob O'Hara Informed Technology,

Comment Type **E** *Comment Status* **X**

Placeholder text is not allowed.

SuggestedRemedy

Replace placeholder text with correct list of officers, members and ballot group members

Proposed Response *Response Status* **O**

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **Introduction**

Cl **XX** *SC* **Many** *P* **General** *L* **-** # **65**

Vic Hayes Lucent Technologies

Comment Type **T** *Comment Status* **X**

The standard is complex, yet the text may be inadequate to implement unambiguously.

SuggestedRemedy

Consider to add material. The material from Tal Kaitz in document 99/107 may be a good starting point.

Proposed Response *Response Status* **O**

Cl **XX** *SC* **misc** *P* **misc** *L* **misc** # **61**

Roger Marks NIST

Comment Type **E** *Comment Status* **X**

I have several editorial comments:

Page 1

Regarding the Title:

"Wireless Medium Access Control (MAC) and physical layer (PHY) specifications: High Speed Physical Layer in the 5 GHz band"

I suggest a more self-consistent capitalization:

"Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications: High Speed Physical Layer in the 5 GHz Band"

Regarding the Abstract:

"Changes and additions to IEEE Std. 802.11 to support the new high rate Physical layer for operation in the 5 GHz band are provided."

I suggest a more self-consistent capitalization:

"Changes and additions to IEEE Std. 802.11 to support the new high rate physical layer for operation in the 5 GHz band are provided."

Page 2

The Keywords "OFDM" and "U-NII" should be expanded

Page 3

Regarding the Participants:

"At the time of sending the draft standard to Sponsor Ballot, IEEE 802.11 had the following officers:"

Since the draft standard is in Sponsor Ballot, this information should be provided.

Page 6, Line 53

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **XX** *SC* **misc**

change "Unlicenced" to "Unlicensed"

Page 7 Line 12: change "5GHz" to "5 GHz"

Page 55, Lines 10-12

(5.15-5.25GHz) => (5.15-5.25 GHz) (5.25-5.35GHz) => (5.25-5.35 GHz) (5.725-5.825GHz) => (5.725-5.825 GHz)

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **XX** *SC* **Participants** *P* **0** *L* **??** # **62**

Stanley Reible MICRILOR, Inc

Comment Type **E** *Comment Status* **X**

Introduction: List of participants should be provided so that voters can review when casting their ballots.

SuggestedRemedy

Complete

Proposed Response *Response Status* **O**