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

Results of LMSC Ballot on Draft Standard 802.11 D5.0

Resolutions for Comments on Clause 9

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
1	9.1.1	TLP	T		When two alternatives are supposed to cover the span of possibilities, they must be logical complements.	Change 9.1.1 to read "If the medium is not sensed busy, the transmission may proceed. "	**Accepted.**
2	9.1.1 9.1.2	TLP	e		Parallel headings should have parallel structure and should assist the reader.	Add "(DCF)" to first heading. Add "(PCF)" to second heading.	**Accepted.**
3	9.1.2	AS	t	y	**The third sentence in the second paragraph states that "all frame transmissions under the point coordination function shall use an IFS that is smaller than the IFS for frames transmitted via the distributed coordination function.** **This contradicts the description in clause 9.3.3.1 which states that "the PC may send its next pending transmission as soon as a PIFS after the end of its last transmission."**	**Delete the third sentence in the second paragraph.**	**Accepted. Changed "shall" to "may".**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
4	9.1.2	AS	t	y	**The resolution of comment 101** The members of a point-coordinated BSS won't even attempt to gain access to the medium out of turn (their NAVs are set), so using PIFS to give the AP priority is wacky. It really is only to allow the AP to grab the medium away from *another* overlapping BSS. **jz) for the ballot on D4.0, was Editorial / Clarification** **Text change in section 9.1.2 without changing the meaning.** **ACCEPTED** **However, the current text still implies that a shorter IFS is used to give the PC priority access to the medium.**	**Delete the fourth sentence in the second paragraph.**	**Accepted. Merged last two sentences of the paragraph with some words deleted**
5	9.1.2	DLP	e		**The last paragraph of this section contains the following typo: "controls the"**	**Change the text to read: "controls the"**	**Accepted.**
6	9.1.2	JMZ	e		Typo	Need space between "controls" and "the" in last sentence.	**Accepted.**
7	9.1.2	TLP	e		Second paragraph has an undefined forward referent. Use "a", not "the", when referring to a not-yet-defined concept.	Change to read "through the use of a virtual carrier sense mechanism".	**Accepted.**
8	9.1.4	AS	E	y	**This section only describes fragmentation of MSDUs.**	**Change references to MSDU to MSDU or MMPDU.**	**Accepted.**
9	9.1.4	AS	t	y	**The last sentence in the last paragraph indicates that all fragments of a single MSDU are sent as a burst using a single invocation of the PCF medium access procedure. This is not true according to the allowed frame exchange sequences in clause 9.7. An STA other the PC can only transfer one MPDU per poll from the PC.**	**Remove the words "or PCF" from the sentence in question.**	**Accepted. 'or PCF' removed. In addition, for clarity, added 'during the DCF' in order to indicate that a 'burst' was not necessarily applicable during the PCF. Added another sentence (new paragraph) that indicates that PCF fragment transmission follows general PCF rules.**
10	9.1.4 fig 37	SD	e		**Figure has to be improved.**	**Realign lines and recenter « CRC » labels.**	**Defered to Editors**
11	9.1.4	TLP	t		Transmission is virtually 100% reliable; reception is not. The text incorrectly associates a reception-related problem with transmission.	Change to read "channel characteristics limit ~~transmission~~ reception".	**Accepted.**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
12	9.1.5	KC	T	Y	"The translations are given in the MAC Data Service State Machine defined in the annex." **There are no such state diagrams in the annex.** This standard is very complex. It is not going to be easy for most implementers to understand all the interactions of the parts presented. It is vital to supply the state diagrams and make them normative It is some indication of ponderous nature of this draft that although these diagrams have been promised, they have not been delivered. A good look at clause 14 will show that the production of state diagrams for that PHY layer added needed clarity. The specification of the MAC layer must match this clarity. Furthermore, I suspect that the framers of clause 14 found a few inconsistencies when they produced these diagrams, and that the same thing will happen in the MAC case.	Put in the MAC state machine diagrams, and make them normative.	Defered to full MAC group Accepted
13	9.2	DLP	e		The fifth paragraph of this section contains the following typo: frame<newline>s.	Change the text to read: "frames."	Accepted.
14	9.2	JMZ	e		Typo	Change "frame s" to "frames"	Accepted.
15	9.2	KC	t	Y	"For this reason the RTS and CTS frames shall be transmitted at one of these mandatory rates." Which one? Does this mean the same rate shall be picked for both RTS and CTS? Is it not the case that CTS is always set by the RTS? What does this mean?	Clarify statement.	Accepted. Added pointer tomultirate section, where algorithm for selection of rate for response frame is explicit.

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	9.2	JD	e		typo	Another means of distributing the medium reservation information is the duration field in directed frames. This field gives the time that the medium is reserved, either to the end of the immediately following ACK, or in the case of a fragment sequence, to the end of the ACK following the next fragment.	Accepted.
17	9.2 2nd ¶	TLP	e		The English of this paragraph is very poor — it is colloquial, judgmental, contains forward referents to as-yet-unspecified concepts, and contains ambiguous pronoun back-referents.	Rewrite as "The CSMA/CA protocol is designed to reduce the collision probability between multiple stations accessing a medium, at the point where collisions would most likely occur. Just after the medium becomes idle following a busy medium (as indicated by the CS function) is when the highest probability of a collision exists. This is because multiple stations could have been waiting for the medium to become available again. This is the situation which necessitates a random backoff procedure to resolve medium contention conflicts."	Accepted.
18	9.2 4th ¶	TLP	E, t		The last sentence describes the inverse of the real relationship. It is the transmitting station that is "hidden" to the non-receiving station, not vice versa. Hiding is not symmetric, and no information is known about the inverse relationship.	Change to read "Thus a station can be unable to receive the originating station, yet still know ..."	Accepted.
19	9.2 5th ¶	TLP	e, T		In general, collisions (that is, concurrent interfering transmissions) on the wireless medium are not detectable, as they are in IEEE 802.3 LANs, but their side-effects may be observed. The procedure described make a collision inference.	Change "fast collision detection" to read "fast collision inference".	Accepted.

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
20	9.2 5th ¶	TLP	e		Poor English	Change "start the process over" to read "repeat the process".	**Accepted.**
21	9.2 6th ¶	TLP	e		Poor English — "hearing" is a process of living beings, not inanimate objects.	Change "can hear the AP, but not all other STAs" to read "can receive the AP, but cannot receive all otherSTAs".	**Accepted.**
22	9.2 7th ¶	TLP	e		Inadequate rationale and poor English.	Change first sentence and beginning of second sentence to read "The RTS/CTS mechanism cannot be used for broadcast and multicast frames because there are multiple destinations for the RTS, and thus potentially multiple concurrent senders of the CTS. The RTS/CTS mechanism".	**Accepted.**
23	9.2 8th ¶	TLP	e		The normative text does not specify which processors of RTS and CTS frames are to perform the specified action.	Change paragraph to read "... duration information contained in a received RTS or CTS frame ..."	**Accepted.**
24	9.2 last ¶ 9.2.4	TLP	e		Other portions of this standard refer to the MIB variable name. This portion should be consistent and also do so, rather than use the circumlocutory way of reference which was presented.	Change "Basic Rate Set" to "aBasicRateSet" in 9.2. Change "SlotTime" to "aSlotTime" in 9.2.4.	**Accepted.**
25	9.2.1	TLP	e		Specify both aspects of the determination that is to be made.	Change sentence to read "When the counter is zero, the virtual carrier sense indication is that the medium is idle; when non-zero, that it is busy.".	**Accepted.**
26	9.2.1 5.1.1.2 (c) 5.2.4.1 5.4 12.all 14.all 15.some 16.all	TLP	e	Yes	The wireless medium is definitely singular (unless there is an alternate universe with multiple "ethers"), or unless P802.11 is extending its charter to acoustic modes of transmission.	change "edia" to "edium" everywhere except when referring to wired media.	**Accepted**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
27	9.2.2 last ¶	TLP	e		The error did not occur in the frame, but in the reception process. Correct the language to reflect the reality.	Change second sentence to end "received the frame correctly, and that the error occurred in the reception of the ACK frame."	**Accepted**
28	9.2.3 1st ¶	TLP	e		The paragraph omits references and descriptive information which would be useful to the reader.	Change to read 'Four different IFSs are defined to provide priority levels for access to the wireless media; they are listed in order, from the shortest to the longest. Figure 38 shows some of these relationships."	**Accepted.**
29	9.2.3	TLP	e		Change Figure 38's title to be correct.	Change to read "Figure 38, Some IFS Relationships".	**Accepted**
30	9.2.3.1	KC	t	Y	"The SIFS shall be the time from the end of the last symbol of the previous frame to the beginning of the first symbol of the preamble of the subsequent frame as seen at the air interface" Symbol times are not defined. No test is specified for finding the beginning or end of a symbol in the air. How will this checked?	**Define the physical events that can be tested to know when a symbol begins and ends, or find a physical event on which to base SIFS.**	**Accepted. Changed "shall" to "is". This changes the problem, since the SIFS is the summation of delay components that span the medium, PHY and MAC, only the MAC contribution to SIFS is important in the MAC clauses, and NOT the entire SIFS, therefore, only the MAC_PRC_DELAY needs to be specified for the MAC using the command "shall." With "is" instead, the text becomes informative in this section.**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
31	9.2.3.2 9.2.3.3 9.2.5.1 9.2.5.2	TLP	E	Yes	The medium is both time-varying and asymmetric. "Detection" that the medium is "free" is not possible. Inference that the medium in not in use (i.e., idle) can be made based on lack of detection that the medium is in use. But such inference of being not-in-use is much less reliable than the detection of being in-use. The language chosen must reflect this lack of reliability in the carrier non-sensing process. Also, the medium is "free" only if there are no usage fees. That aspect has nothing to do with whether the medium is currently in use. Words with the proper connotations, such as "idle" and "busy", should be used.	Change the second sentence of 9.2.3.2 to read "A STA using the PCF shall be allowed to transmit contention-free traffic after it senses the medium idle at the TxPIFS slot boundary ..." Change the second and third sentences of 9.2.3.3 to read "A STA using the DCF shall be allowed to transmit if it senses the medium to be idle at the TxDIFS slot boundary as defined in 9.2.9 after a correctly-received frame and its backoff time has expired. A STA using the DCF shall not transmit within an EIFS after it senses the medium to be idle following reception of a frame ..." Change the second paragraph of 9.2.5.1 to read "when the STA senses the medium to be idle for greater ". Change first paragraph to read "when a transmitting STA infers a failed transmission". Change second paragraph to read "a DIFS period during which the medium is sensed inactive for the duration of the DIFS period, or following an EIFS period during which the medium is sensed inactive for the duration of the EIFS period".	**Accepted.**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
32	9.2.3.3 9.2.3.2 9.2.5.1 9.2.5.2	TLP	E	Yes	The medium is both time-varying and asymmetric. "Detection" that the medium is "free" is not possible. Inference that the medium in not in use (i.e., idle) can be made based on lack of detection that the medium is in use. But such inference of being not-in-use is much less reliable than the detection of being in-use. The language chosen must reflect this lack of reliability in the carrier non-sensing process. Also, the medium is "free" only if there are no usage fees. That aspect has nothing to do with whether the medium is currently in use. Words with the proper connotations, such as "idle" and "busy", should be used.	Change the second sentence of 9.2.3.2 to read "A STA using the PCF shall be allowed to transmit contention-free traffic after it senses the medium idle at the TxPIFS slot boundary ..." Change the second and third sentences of 9.2.3.3 to read "A STA using the DCF shall be allowed to transmit if it senses the medium to be idle at the TxDIFS slot boundary as defined in 9.2.9, after a correctly-received frame, and its backoff time has expired. A STA using the DCF shall not transmit within an EIFS after it senses the medium to be idle following reception of a frame ..." Change the second paragraph of 9.2.5.1 to read "when the STA senses the medium to be idle for greater ". Change first paragraph to read "when a transmitting STA infers a failed transmission". Change second paragraph to read "a DIFS period during which the medium is sensed inactive for the duration of the DIFS period, or following an EIFS period during which the medium is sensed inactive for the duration of the EIFS period".	**Sames as 31**
33	9.2.4	JMZ	t		The paragraph beginning "The Contention Window" is poorly worded with respect to remaining at CWmax.	Insert "Once it reaches a CWmax," before "the CW shall remain at the..."	Accepted.

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
34	9.2.4	KC	T	Y	Given the definition of EIFS in 9.2.3.4, one would expect that allSTAs that try to receive any frames that are transmitted at a data rate that is not one of those supported by the STA will generate CRC errors and then use EIFS instead of DIFS for backoff, and therefore be at a disadvantage resulting in unfair access.	Change to only one delay time for both cases, or think of something else that is fair.	Comment withdrawn by author. Based upon misunderstanding of units used in aACKSize MIB parameter. (I.e. parameter is specified as bytes, 8x gives usec) The re cannot be any unfairness since the EIFS time is the time for an ACK plus SIFS. This is also the time anyone hearing the frame correctly would have set their NAV, so both successful and unsuccessful reception would cause the same amount of backoff. If the frame was a broadcast then unsuccessful receiption could only be because of bit errors not because of unsupported rate, since all broadcasts are sent at one of the aBSSBAsicRateSet rates.Also, deleted sentence in 9.2.3.4 specifying that NAV decrementing shall be suspended during an EIFS, since this would make the EIFS node sufffer from an unfair disadvantage.
35	9.2.4	RM	t	N	Definition of CW = An integer between the values of MIB attributesaCWmin andaCWmax, For consistency across implementations, the endpoints should be explicitly included or excluded.	CW = An integer within the range of ~~between the~~values of MIB attributes aCWmin andaCWmax, CWmin<CW<CWmax	Accepted.

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
36	9.2.4	TLP	e		Specify both aspects of the determination that is to be made.	Change to read "after a DIFS is detected with the medium idle when the last frame detected on the medium was received correctly, or an EIFS is detected with the medium idle when the last frame detected on the medium was not received correctly"	**Accepted.**
37	9.2.4 3rd ¶	TLP	E	Yes	"The CW shall take the next value in the series (or a higher value) every time an unsuccessful attempt to transmit an MPDU causes either Station Retry Counter to increment." This portion of the sentence is very unclear. What series? Which series, since there are apparently two? Does "next value" imply pre-incrementation as it seems to, or post-incrementation as described in the prior two sentences?	Please rewrite to be unambiguous.	**Accepted.** **Deleted (or higher value).**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
38	9.2.5.1 9.2.3.2 9.2.3.3 9.2.5.2	TLP	E	Yes	The medium is both time-varying and asymmetric. "Detection" that the medium is "free" is not possible. Inference that the medium in not in use (i.e., idle) can be made based on lack of detection that the medium is in use. But such inference of being not-in-use is much less reliable than the detection of being in-use. The language chosen must reflect this lack of reliability in the carrier non-sensing process. Also, the medium is "free" only if there are no usage fees. That aspect has nothing to do with whether the medium is currently in use. Words with the proper connotations, such as "idle" and "busy", should be used.	Change the second sentence of 9.2.3.2 to read "A STA using the PCF shall be allowed to transmit contention-free traffic after it senses the medium idle at the TxPIFS slot boundary ..." Change the second and third sentences of 9.2.3.3 to read "A STA using the DCF shall be allowed to transmit if it senses the medium to be idle at the TxDIFS slot boundary as defined in 9.2.9 after a correctly-received frame, and its backoff time has expired. A STA using the DCF shall not transmit within an EIFS after it senses the medium to be idle following reception of a frame ..." Change the second paragraph of 9.2.5.1 to read "when the STA senses the medium to be idle for greater ". Change first paragraph to read "when a transmitting STA infers a failed transmission". Change second paragraph to read "a DIFS period during which the medium is sensed inactive for the duration of the DIFS period, or following an EIFS period during which the medium is sensed inactive for the duration of the EIFS period".	**Same as 31**
39	9.2.5.2	DLP	e		**The last paragraph of this section contains the following typo: "e xpiration"**	**Change the text to read: "expiration"**	**Accepted.**
40	9.2.5.2	SB	t	N	The following statement in 9.2.5.2: *In an IBSS, the backoff time shall not decrement in the period from TBTT until the expiration of the ATIM window. Beacon and ATIM frames may be transmitted*	Remove two sentences from 9.2.5.2 ~~In an IBSS, the backoff time shall not decrement in the period from TBTT until the expiration of the ATIM~~	Declined. Rationale is that in previous contention interval, (i.e. the previous non-ATIM window period) the STA of the IBSS

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
					during this same period. Seems to be in conflict with 11.2.2.4 which says: *All STAs shall use the backoff procedure defined in clause 9.2.5.2 for transmission of the first ATIM following the Beacon. All remaining ATIMs shall be transmitted using the conventional DCF access procedure.* If STAs are using the back-off procedure within the ATIM window as in 11.2.2.4, then the back-off time must decrement else nothing would ever be transmitted. I think that the attempt here is to try and define what happens to a data/management frames that is in back-off and had not been sent by the start of the next ATIM window at the TBTT. This seems to be undefined in the standard - it is not clear whether a frame that has been announced and is not sent due to a busy medium (and hence back-off) should: a) be re-announced and retried in the next beacon interval with the original back-off time held over the ATIM window, or b) it should be retried afresh (given that the first frame transmitted will have back-off applied anyway). I seem to remember that we previously discussed and settled on the latter as the proper case -ie the frame (or partial frame if fragmented) is re-announced afresh.	~~window. Beacon and ATIM frames may be transmitted during this same period.~~ One might conclude that some text is required about MSDUs in back-off at the start of the ATIM window in 11.2.2.4 as well for clarity.	network have been colliding and backing off in order to create a free space on the medium in which to get traffic sent. The contention resolution process takes an average time which is longer and longer as the number of nodes in the IBSS increase, and hence, it is possible that just as the IBSS is getting some traffic through, following a long round of contention resolution, the next ATIM window arrives and if all STA draw random numbers fresh from CWmin, then after each ATIM, the traffic pattern will once again degenerate to one of litttle traffic sent and much contention. It is preferred to save the state of the network which is the result of the previous contention resolution and so avoid the problem of having to start the resolution process over, when the probasbility of collision will be high.
41	**9.2.5.2 fig 41**	**SD**	**E**		**This figure should be made more readable.**	**Redraw it.**	**Defer to Editors.**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
42	9.2.5.2 9.2.3.2 9.2.3.3 9.2.5.1	TLP	E	Yes	The medium is both time-varying and asymmetric. "Detection" that the medium is "free" is not possible. Inference that the medium in not in use (i.e., idle) can be made based on lack of detection that the medium is in use. But such inference of being not-in-use is much less reliable than the detection of being in-use. The language chosen must reflect this lack of reliability in the carrier non-sensing process. Also, the medium is "free" only if there are no usage fees. That aspect has nothing to do with whether the medium is currently in use. Words with the proper connotations, such as "idle" and "busy", should be used.	Change the second sentence of 9.2.3.2 to read "A STA using the PCF shall be allowed to transmit contention-free traffic after it senses the medium idle at the TxPIFS slot boundary ..." Change the second and third sentences of 9.2.3.3 to read "A STA using the DCF shall be allowed to transmit if it senses the medium to be idle at the TxDIFS slot boundary as defined in 9.2.9 after a correctly-received frame and its backoff time has expired. A STA using the DCF shall not transmit within an EIFS after it senses the medium to be idle following reception of a frame ..." Change the second paragraph of 9.2.5.1 to read "when the STA senses the medium to be idle for greater ". Change first paragraph to read "when a transmitting STA infers a failed transmission". Change second paragraph to read "a DIFS period during which the medium is sensed inactive for the duration of the DIFS period, or following an EIFS period during which the medium is sensed inactive for the duration of the EIFS period".	**Same as 31**
43	9.2.5.2	WD	t		**The last paragraph of this section explains that normal backoff decrements should be defered during an ATIM window. However the same procedure is used prior to transmissions of the Beacon or ATIM frames. So the rule as stated should only apply to a pending frame that is pending to be transmitted outside the ATIM window.**	In an IBSS, the backoff time for a pending non-Beacon or non-ATIM transmission shall not decrement in the period from TBTT until the expiration of the ATIM window. Beacon and ATIM frames may be transmitted	**Accepted.**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
						during this same period.	
44	9.2.5.2 last ¶	TLP	E	Yes	TBTT is an acronym not used until this point; it deserves to be spelled out so that the reader stands a chance of understanding the concepts being exposed here. It is not clear that TBTT is an explicit moment in time; most such acronyms stand for intervals. A good deal more work on explaining this concept is needed.	Rewrite to clarify.	**Accepted.** **Expand acronym.** **Added pointer to Clause 11**
45	9.2.5.3	DLP	e		**The second paragraph of this section contains the following typo: "independ ently"**	**Change the text to read: "independently"**	**Accepted.**
46	9.2.5.3	TLP	e		Interference occurs "in" the logical channel; "on" would require a physical channel (such as a wire), but the electromagnetic wireless channel has no physical essence — the "ether" does not really exist.	Change "interference on" to "interference in".	**Accepted.**
47	9.2.5.3	TLP	e		Humans "believe". Possibly animals "believe". Computer programs do not "believe".	Change to read "which the initiating station infers have failed."	**Accepted.**
48	9.2.5.3 6th ¶	TLP	e		The station doing the filtering is not identified. The type of filtering is not identified by its proper name.	Change fourth sentence to read "This duplicate MSDU shall be filtered at the receiving station using the normal duplicate frame filtering mechanism."	**Accepted.**
49	9.2.5.4	KC	t	Y	**1 microsecond of what?**	**State what it is and how it is measured.**	**Accepted.** **Sentence deleted.**
50	9.2.5.4 fig 42	SD	T		**The period of duration (2x SIFSTime) + (CTS_Time) + (2x aSlotTime) during which a STA has to wait until it sets its NAV should be represented.**	**Modify the figure**	**Declined.** **Text provides enough clarity.**
51	9.2.5.4 2nd ¶	TLP	e		An "estimate" is being discussed, not "state" information. Single-digit numerals should be written out. The condition is anticipated, not known. The inverse of busy is "idle", nor "free".	Change to "Maintenance of the NAV shall consist of an internal estimate accurate to one microsecond, of the anticipated busy/idle condition of the medium.".	**Accepted.**
52	9.2.5.4 last ¶	TLP	t		The receiver can only infer the data rate of transmission, but it can directly detect the data rate of reception. So referencing the receiving process eliminates the need to go into the inferential aspects that would otherwise arise.	Change end of paragraph to read "most recent NAV update was received."	**Accepted.**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
53	9.2.5.5	DLP	e		**The third to last bullet point of this section contains the following typo: "than a n initial"**	**Change the text to read: "than an initial"**	**Accepted.**
54	9.2.5.5 fig 43	SD	E		**This figure should be made more readible.**	**Redraw it.**	**Defered to Editors**
55	9.2.5.6	DLP	e		**The last sentence of the last paragraph of this section refers to Frame 1, when it should be Fragment 1.**	**Change the text to read: " from Fragment 1 has expired."**	**Accepted.**
56	9.2.5.6	DLP	t		**Should Figure 45 use Fragment 0 or is this an example of a retransmission? If so, should the text clarify this example?**	**No change may be necessary.**	**Accepted. Removed number designation so that fragment number is not identified in the diagram.**
57	9.2.5.6	SB	E	N	This clause seems to be somewhat misleading. Also may's and shall's got a bit misleading in this clause. In some cases *will* is the correct term since the action arises as default - not out of choice eg frame simply wasn't received. Also some clarification required as to when STAs only able to hear the destination will be access the channel. Since the second part of the clause does not really relate to figure 45 delete the references to CTS and frame 1 and make them more general.	Suggested text: In the case where an acknowledgment is sent but not received by the source station, stations that heard the Fragment, or ACK will mark the channel as busy for the next frame exchange due to the NAV having been updated from these frames the NAV shall be marked busy for the next frame exchange. This is the worst case situation and. This is shown in Figure 45. If an the acknowledgment is not sent by the destination station, stations that can may only hear the destination station will shall not update their NAV and may attempt will be free to access the channel when their NAV updated from the previously received frame reaches zero. All stations that hear the source will be free to access the channel after their NAV updated from the transmitted fragment Frame 1 has expired.	Accpeted.
58	9.2.5.6 fig 44	SD	E		**This figure should be made more readible.**	**Redraw it.**	**Defer to Editors.**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
59	9.2.5.6 fig 45	SD	e		**NAV (Fragment 1) should not overlap NAV (RTS) and should be on the line.**	**Shrink and move it.**	**Declined.** **The NAV of fragment 1 starts at the end of fragment 1, which is why it overlaps the NAV of RTS.**
60	9.2.5.6 3rd ¶	TLP	e		As before, use "will" in predictive statements, "shall" in legislative ones.	Change to "... stations that may only hear the destination station will not update their NAV ..."	**Accepted.**
61	9.2.5.7	KC	e		**The heading "Directed MPDU Transfer Procedure" has no subsection marking.**	**"9.2.5.7.1 Directed MPDU Transfer Procedure"**	**Accepted.** **Heading changed to 9.2.6**
62	9.2.5.7 last two ¶s	TLP	e	Yes	These paragraphs contain inappropriate language, including references to "payload" frames and other concepts not employed elsewhere in this draft.	Change these two paragraphs to read "When an RTS/CTS exchange is used, the asynchronous Data frame shall be transmitted after the end of the CTS frame and a SIFS period. No regard shall be given to the busy or free status of the medium when transmitting this Data frame. When an RTS/CTS exchange is not used, the asynchronous Data frame shall be transmitted following the success of the basic access procedure. With or without the use of the RTS/CTS exchange procedure, the STA which is the destination of an asynchronous Data frame shall follow the ACK procedure."	**Accepted.**
63	9.2.5.8	SB	e	N	Heading 'Directed MPDU Transfer Procedure' in normal text style	Change to heading for clause 9.2.5.8	Accepted.
64	9.2.6 1st ¶	TLP	e		Incorrect language used.	Change "mechanism" to "procedure" twice.	**Accepted.**
65	9.2.6 2nd ¶	TLP	t	Yes	The time-varying property of the channel, which may be the most important problem for implementors, is omitted.	Change to read "due to the increased probability of lost frames from interference or collisions or time-varying channel properties."	**Accepted.**

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66	9.2.7	DLP	e		The last paragraph of this section contains the following typo: "PHYRXEND.indicateand"	Change the text to read: "PHYRXEND.indicate and"	Accepted.
67	9.2.7	JMZ	e		Typo	Change "PHYRXEND.indicateand" to "PHYREXEND.indicate and"	Accepted.
68	9.2.7 2nd ¶	TLP	e		"Always" applies to every use of "shall", and thus is always redundant.	Delete the word "always".	Accepted.
69	9.2.8 6th ¶	TLP	e	Yes	If you are going to reference a specific LAN protocol, at least reference an IEEE standard, which Ethernet is not.	Change to read "(similar to an FCS error in other LAN protocols)."	Accepted
70	9.2.9	KC	t	Y	See 9.2.3.2 and 9.2.3.3 above. Given that symbol time is not defined one might assume that it is the sampling point in the center of the symbol for GFSK, or in a DSP system, it is the point when enough samples have been processed so as to be 90% sure of the symbol value. Neither of these is "in the air."	State what it is and how it is measured.	Accepted, but deferred to PHY groups to define the boundary of a symbol. PHY MIB variables aRXRFDelay andzTXRFDelay to be changed to reference end of symbol on air and beginning of symbol on air, respectively. This now allows a chain of relationships beginning and ending with medium symbol events, and linking through service primitives.
71	9.2.9 1st ¶	TLP	e		The use of the word "per" in this context is inappropriate; inverse units are not implied.	Change to read "... are provided by the specific PHY."	Accepted.
72	9.2.9 2nd ¶ last ¶	TLP	t		Since symbols have duration, the measurement must specify which point in the symbol timing is being used. Later text in this area indicates that it is the end of the symbol that is intended.	Change 2nd ¶ to read "All timings that are referenced from the end of the transmission are referenced from the end of the last symbol of a frame on the medium." Change last ¶ to read "The starting reference of these slot boundaries is again .."	Accepted.
73	9.3	AS	t	y	A CF-Pollable station can only transmit one MPDU when polled by the PC (the frame exchange table in 9.7), in contrast to what it says in the eighth sentence of the first paragraph.	Change MSDU to MPDU.	Accepted.

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
74	9.3	AS	t	y	The second last sentence in the second paragraph says that the PC retains control of the medium by using PIFS. This is untrue. The PC retains control of the medium because everyone's NAV is set.	Remove the last part of the sentence, "by waiting the PIFS duration before resuming CF transfers".	Accepted.
75	9.3	AS	t	y	The first sentence in the second paragraph states that the PC shall not perform a backoff on retransmission of an unacknowledged frame during the CFP. My understanding from clause 9.3.3.1 is that the PC may resume transmission after a PIFS but is not required to. In 9.3.3.3 the PC is specifically allowed to use a backoff prior to retransmission.	Change the shall to a may.	Accepted, except that it is "shall not" that shall be changed to "may".
76	9.3.1 fig 48	SD	E		This figure should be made more readable.	Redraw it.	Defered to Editors.
77	9.3.1 fig 50	SD	E		This figure should be made more readable.	Redraw it.	Defered to Editors.
78	9.3.2.1	TLP	E		The first sentence makes little sense. The meaning of the words "as is used" is extremely unclear. Also, does this apply to the last fragment/segment as well? Does it apply whether an ACK is required or not?	Rewrite this sentence.	Accepted. Acutally this is 9.2.3.1. Reworded sentence.
79	9.3.2.1	TLP	e		The term "free" is inappropriate; use "idle".	Change to read "When the medium is sensed to be idle for one PIFS period,".	Accepted.
80	9.3.2.2	JMZ	e		Typo	Change "ofany" to "of any"	Accepted.
81	9.3.2.2	TLP	e		An unnecessary constraint should be removed, since it is redundant 100% of the time.	Delete "containing such an element that"	Accepted.
82	9.3.2.3	TLP	e		The term "free" is inappropriate; use "idle".	Change to read "medium be sensed as being idle".	Accepted.
83	9.3.3	AS	t	y	The second last sentence is inconsistent with the frame exchange table in clause 9.7. The only valid responses for a CFPollable station in this scenario are CF-ACK(no data) or Null(no data)	Change ACK or CF-ACK to CF-ACK or Null.	Accepted.
84	9.3.3	AS	t	y	The last paragraph allows and ACK to be a valid response to a CF-Poll. This is not allowed in the frame exchange table in 9.7.	Change ACK or CF-ACK to CF-ACK or Null.	Accepted.
85	9.3.3 fig 51	SD	E		This figure should be made more readable.	Redraw it.	Defered to Editors.

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86	9.3.3.1	AS	t	y	The second last sentence in the first paragraph says that the PC retains control of the medium by using PIFS. This is untrue. The PC retains control of the medium because everyone's NAV is set.	Delete sentence.	Accepted.
87	9.3.3.1	AS	t	y	In the paragraph starting with "For frames that …", the fifth sentence states that only the last fragment of a burst from an STA may be acknowledged with a CF-ACK. This is not true since CFP operation as defined in the frame sequences in 9.7 does not require a PC to transfer all fragments of a MSDU or MMPDU before polling the next station.	Delete the sentence "This shall only occur if the …"	Accepted.
88	9.3.3.1	JMZ	t		The fact that the new sentence starting "Non-CF-Pollable stations" only applies during the CFP needs to be made explicit (otherwise is breaks NAV totally)	Change "frame shall" to "frame during the Contention-Free Period shall"	Accepted. Also chopped out DCF modifier from 'DCF ACK', since all other references to non-CF-Ack are listed as just 'ACK'.
89	9.3.3.2 fig 52	SD	E		This figure should be made more readable.	Redraw it.	Defered to Editors
90	9.3.3.2 fig 52	SD	t		The StS frame does not represent anything.	Remove the StS frame and the following Ack frame by a unique U1-ack frame.	Declined. Comment is incorrect.
91	9.3.3.3	SB	E	N	Clarify use of optional protocol function by stronger language than simply the use of may. The PC may also use this backoff during the CFP prior to retransmitting an unacknowledged, directed data or management frame.	Suggested text: The PC may optionally also use this backoff during the CFP prior to retransmitting an unacknowledged, directed data or management frame.	Accepted.
92	9.3.3.4 last paragraph	SD	T		A figure should represent the CFPMaxDuration.	Draw the figure.	Declined. Text provides enough clarity.

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93	9.3.3.5	AS	t	y	The second sentence in the first paragraph states "… and shall acknowledge the receipt of all other Data and Management frames using ACK control frames …" According to the frame sequences in 9.7 table 20, a CF-Pollable station may only respond with an ACK control frame if it is sent a directed data frame without a CF-Poll.	Replace the last part of the sentence ", sent after a SIFS period…" with "sent after a SIFS period. During the CFP, CF-Pollable stations shall acknowledge the receipt of a Data frame (without the CFAck or CF-Poll bits) or a management frame using an ACK control frame sent after a SIFS period."	Accepted. Except text was reworded to cover the CF-pollable station's response to each of the possible frames that may be received.
94	9.3.4.1	AS	t	y	The last sentence in paragraph 1 indicates that polling of power saving stations is done before polling of non-power saving stations. This seems to introduce an unfairness in the polling mechanism in that if the power saving stations have sufficient traffic they could indefinitely delay the traffic to non-power save stations.	Remove the last sentence, or put in a polling mechanism that is fair.	Accepted. New wording proposed by Michael Fischer and accepted by commentor. PC may send to any subset of STA, but increasing SID restriction remains in place. Requirement that power save STA frames shall be delivered first has been removed.
95	9.4	AS	e	y	The last sentence in the third paragraph states that the contents of a fragment shall be fixed after its initial transmission until it is successfully delivered. This does not take into account the retry bit.	Change "shall be fixed" to "shall be fixed, with the exception of the retry bit,"	Accepted. Only the Frame-body is fixed, since retry bit and subtype and CRC may change.
96	9.4	AS	t	y	This section only describes fragmentation of MSDUs. I believe the intent of the standard is to allow fragmentation of MMPDUs.	Change occurrences "MSDU" to "MSDU or MMPDU".	Accepted.
97	9.4	KC	t	Y	"The timer starts on the attempt to transmit the first fragment ..." When does it start? Is it at the "attempt" to transmit (delayed because of backoff or medium busy etc.) or the first Tx energy above the background noise, or what?	State what it is and how it is measured.	Accepted. TXLifetime timer should start with LLC-MAC service primitive MAUNITDATA.request.

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
98	9.5	AS	t	y	This section only describes reassembly of MSDUs. I believe the intent of the standard is to allow fragmentation of MMPDUs.	Change occurrences "MSDU" to "MSDU or MMPDU".	Accepted.
99	9.5	DLP	e		The xx.xx place marker needs to be removed.	Replace xx.xx with the section in parentheses.	Accepted.
100	9.5	JMZ	e		Editing	Fill in reference marked 'xx.xx'	Accepted.
101	9.5	KC	E		"All stations shall support the simultaneous reception of a minimum of 3 MSDUs." I know that it means that the fragments of at least 3 MSDU are to be supported for reconstruction at any given time, but what it says is impossible.	The fragments of at least 3 MSDU shall be able to be supported for reconstruction at any given time.	Accepted.
102	9.5	KC	E		"... to receive additional simultaneous MSDUs."	... to receive additional contemporaneous MSDUs.	Accepted. See 105
103	9.5	KC	e		"described in xx.xx"	replace "xx.xx" with reference	Accepted
104	9.5 last paragraph	SD	e		typo	« xx.xx (9.2.8 duplicate» should be changed in «9.2.8 (duplicate»	Accepted.

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105	9.5 3rd & 4th un-indented ¶s 9.8 1st two ¶s	TLP	E		The word "simultaneous" means exactly contemporaneous. It is highly unlikely that any STA commences transmission or reception of two MPDUs or two MSDUs simultaneously on the single instance of a wireless LAN being described by this standard. Even at the internal software level, the CPU is servicing only one MSDU on any given machine cycle. The word "concurrent" means overlapping in time, which is the sense intended here. At the lowest level, the servicing of the MSDUs is interleaved by the STA's CPU. Even at this level the correct description is "concurrent", not "simultaneous". In contrast, multiple wireless LANs can be operating simultaneously, and not just concurrently, on non-overlapping channels. In summary, "simultaneous" is a much stronger term, implying much more than temporal overlap. "Concurrent" is the proper term for this situation.	Change "simultaneous" to "concurrent" at each occurrence in each paragraph.	**Accepted.**
106	9.6	AS	t	y	**The last paragraph refers to PHY mandatory rates. I believe this is a remnant which was supposed to have been fixed due to previous comment resolutions.**	**Change "PHY mandatory rates" to "rates in the aBSSBasicRateSet".**	**Accepted.**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
107	9.7	AS	t	y	**Frame sequences 2 and 3 in table 20 imply that to transmit a management frame during a CFP, the PC must transmit a CFAck a SIFS period before starting to transmit the Mgmt frame. This doesn't make sense.** **Frame sequences 2 and 3 in table 20 are also the only sequences where both frames are initiated by the PC.**	**The Frame sequences should be:** **Mgmt(bc)** **Mgmt(dir) - ACK** **Data(bc/mc)** **Data(dir)+CF-Poll{+CFAck) - Data(dir)+CF-Ack {- CF-Ack(no data)}** **Data(dir)+CF-Poll{+CFAck) - CF-Ack(no data)** **Data(dir)+CF-Poll{+CFAck) - Data(dir)+CF-Ack - ACK** **CF-Poll(no data){+CFAck) - Data(dir) {- CF-Ack(no data)}** **.** **.** **.**	**Accpted.**
108	9.7	**JMZ**	t		The revised CF sequences no longer make it clear that some kind of CF-End **must** be transmitted to mark the end of the CFP. I understand that it can be broken up for various reasons, but we should clarify that there must be exactly one (square-brackets was wrong, since you cannot send more than one) CF-End per CFP.	Add a sentence clarifying this requirement.	Accepted frame table correction - changed square brackets to curly braces. However, it was felt that this is the inappropriate location to describe the fact that there should be only one CFP-End per CFP period.
109	9.7	WD	E		**The Table 19 does not show the relevant ATIM related sequences.**	**Add to the table:** **ATIM - Ack 2**	**Declined,** **Exchange is already covered by Last - ACK.**
110	9.7	MAF	E	{na}	**Table 19 does not show the ATIM sequence.**	**Add to Table 19:** **ATIM - Ack 2**	**Declined,** **Exchange is already covered by Last - ACK.**

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111	9.7 table 19	TLP	e		A multicast is listed as permitted in a management frame where it cannot occur	Delete "or multicast" from the second non-heading row of the table.	**Accepted.**
112	9.8 6.1.3 Annex A.4.4.1 PC8.2	GMG	T	Y	**The MSDU ordering provisions have been included in this standard to provide an optional alternative for those applications that do require strictly ordering service, for those cases where the type of frame reordering introduced by the Power Management buffering provisions will cause a problem.** **The intent of this provision was to have an alternative available, but it would be an option that would not affect the normal implementation. However the PICS does not list this provision as optional. Therefore these sections should be deleted, or it should be made clear in the text that this is optional and not mandatory functionality.**	**Delete sections 6.1.3, 9.8 and PC8.2 in Annex. A. OR Mark this functionality as optional.**	**Accepted. We fixed only section 9.8.**
113	9.8 6.1.3 Annex A.4.4.1	MAF	T	Y	**The strictly ordered service class was included in this standard to provide an alternative method to handle those cases where the type of frame reordering possible when using Power Management buffering might cause a problem for a higher layer protocol** **The intent of this provision was to provide a strictly ordered alternative for the applications which may require one, but not to make this facility mandatory for all implementations. Unfortunately the cited sections and the PICS do not list this facility as optional.**	**Change PC8.2 from status "M" to status "O". Add a sentence to 6.1.3 and 9.8 to indicate the strictly ordered service is optional.** **Note that, in 6.2.1.3, the transmission status of "unavailable service class" is already specified to be returned if strictly ordered service is requested but is not available.**	**Accepted, see comment 112 from GMG.**
114	9.8	AS	e	y	**The first sentence in the third paragraph is a hard read.**	**Replace "sent using" to "of".**	**Accepted.**
115	9.8	JMZ	e		Editing	Delete spurious copy of "Individual frames..." sentence at the end.	Accepted.
116	9.8 6.1.3 7.1.3.1.	MT	T		**ref: MT_15** **strictly order frames can be supported by having the**		**Comment request declined - authro isok with thhis resolution.**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
	10 9.8				**AP send multicast packets twice – once with the strictly order bit set and once without** **the strictly ordered multicasts would be sent when the multicast was received. The non-strictly ordered multicast would be sent during the DTIM for power save nodes.** **The power save nodes would take the non-strictly ordered multicast and non-power save nodes would take the strictly ordered multicast (regardless of whether the station is configured for strictly ordered)** **rationale: without this modification, latency will increase because packets will have to defer in order to maintain transmission order (a multicast has to be delayed until the DTIM requiring that all subsequent directed packets will be deferred in order to maintain order**		
117	9.8	SB	e	N	Spurious text: 'Individual frames within each of these sequences are separated by a SIFS'	Delete sentence	Accepted.
118	**9.8 6.1.3 Annex A.4.4.1**	**MAF**	**T**	**Y**	**The strictly ordered service class was included in this standard to provide an alternative method to handle those cases where the type of frame reordering possible when using Power Management buffering might cause a problem for a higher layer protocol** **The intent of this provision was to provide a strictly ordered alternative for the applications which may require one, but not to make this facility mandatory for all implementations. Unfortunately, the cited sections and the PICS do not list this facility as optional.**	**Change PC8.2 from status "M" to status "O". Add a sentence to 6.1.3 and 9.8 to indicate the strictly ordered service is optional.** **Note that, in 6.2.1.3, the transmission status of "unavailable service class" is already specified to be returned if strictly ordered service is requested but is not available.**	**Accepted, see comment 112 from GMG.**

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119	**9.8 1st two ¶9.5 3rd & 4th un-indented ¶s s**	**TLP**	E		The word "simultaneous" means exactly contemporaneous. It is highly unlikely that any STA commences transmission or reception of twoMPDUs or twoMSDUs simultaneously on the single instance of a wireless LAN being described by this standard. Even at the internal software level, the CPU is servicing only one MSDU on any given machine cycle. The word "concurrent" means overlapping in time, which is the sense intended here. At the lowest level, the servicing of theMSDUs is interleaved by theSTA's CPU. Even at this level the correct description is "concurrent", not "simultaneous". In contrast, multiple wireless LANs can be operating simultaneously, and not just concurrently, on non-overlapping channels. In summary, "simultaneous" is a much stronger term, implying much more than temporal overlap. "Concurrent" is the proper term for this situation.	Change "simultaneous" to "concurrent" at each occurrence in each paragraph.	**Accepted.**
120	A4.5	**JMZ**	t		The FH PHY PICSProforma does not make it clear that support for any given regulatory domain is optional. The implication is that all N of them must be implemented in any conformant device. This is a ridiculous requirement.	Correct the PICS to indicate that support for any given regulatory domain is optional.	Accepted. Being fixed by MAF