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 7

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	7.1.1	SB	E	N	Paragraph three of this clause refers to an FCS field whereas elsewhere in this clause this field is referred to as a CRC field. There is also a necessity to define a transmission order for the WEP ICV which is also a CRC-32.	Change to clause 7.1.1 either as follows, or to capture this intent: Fields that are longer than a single octet are depicted with the least significant octet on the left. The least significant bit of each octet is defined as bit 0 for that octet and is the leftmost bit of the octet ~~(except the FCS field)~~ Any field containing a Cyclic Redundancy Code (CRC) shall be an exception to this convention and shall be transmitted commencing with the coefficient of this highest order term. Fields that are less than one octet in length are ordered with the least significant bit to the left.	Recommend Accept and make appropriate change to 7.1.1
2	**7.1.1** (also see related issue with	**MAF**	**E**	**(na)**	**The technical intent of this paragraph on bit and octet ordering is correct: All fields other than CRC fields are to be depicted in the standard, and sent across the MAC/PLCP boundary in conformant implementations, least significant bit first; while CRC fields are sent most significant bit first. This**	Fields that are longer than a single octet are depicted with the least significant octet on the left. The least significant bit of each octet is defined as bit 0 for that octet and is the leftmost bit of the octet. The sole	See (1 - SB) Accepted

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	8.2.5)				**ordering of CRC fields is consistent with CRC-32 in other 802 protocols (and is simpler to implement in most cases). However, the existing text is confusing (at best) because there is not an "FCS field" defined in Clause 7.** **The corrected text in the next column does not just replace "FCS field" with "CRC field" for 2 reasons:** **(1) While there is a CRC field defined in 7.1.3.6, there are other CRCs referenced in the standard, so this change might still be ambiguous.** **(2) The same issue exists with the ICV field defined in Clause 8.2.5, which is also a 4-octet field containing a CRC-32 polynomial remainder.** **By correcting the text as shown to the right, all of the CRC-related ordering issues are covered, without requiring enumeration of field names in a "conventions" sub-clause.** **(Note: This sub-clause pertains to MAC conventions, but the wording to the right is also correct when applied to all CRCs in the standard, because the PLCP CRC fields in all PHYs are transferred with the highest order coefficient first.)**	~~(~~exceptions~~-~~are fields containing Cyclic Redundancy Check (CRC) codes, which are transmitted starting with the coefficient of the highest order term~~the FCS field)~~. Fields that are less than one octet in length are ordered with the least significant bit to the left.	
3	7.1.1, 7.3.1	SB	t	N	Clause 7.1.1 relies on the depiction of fields in diagrams to define the ordering convention: ~~~~~~~~~~ The protocol data units (PDUs) in the MAC sublayer are described as a sequence of fields in specific order. *Each figure in clause 7 depicts the fields as they appear in the MAC frame and in the order in which they are transferred, leftmost field first.* The sequence of octets in the fields of the MAC frame forms an octet stream at the MAC/PLCP sublayer boundary. *The leftmost octet in each field of the MAC*	Add figures for each of these fields (preferred) or define an ordering convention that does not depend on the depiction of fields in figures. Figures will not fit in this column, but I would be happy to provide them if this comment is accepted.	Accept Figures added

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					frame is passed across the MAC/PLCP boundary first. *Fields that are longer than a single octet are depicted with the least significant octet on the left. The least significant bit of each octet is defined as bit 0 for that octet and is the leftmost bit of the octet (except the FCS field). Fields that are less than one octet in length are ordered with the least significant bit to the left.* ~~~~~~~~~ Problem is there are no pictures for any of the fixed fields in clause 7.3.1. Therefore the transmission order of the following is undefined: Authentication Algorithm Number Authentication Transaction Sequence Number Beacon Interval Capability Information Current AP Address Listen Interval Reason Code Station ID (SID) Status Code Timestamp		
4	**7.1.3.1. 6.1.3 10 9.8**	**MT**	**T**		**ref: MT_14** **The strictly order service class does not accomplish the necessary goals. The current definition allows for a STA only to order its transmitted packets. The requirement is that the received packets maintain order. What is needed is a method for a station to identify to all other stations of this requirement.** **See also MT_15**	**During the AUTHENTICATION process (since authentication is common among infrastructure and IBSS networks, and association is not), additional information such as capability and requirements should be exchanged. At this time, a STA requiring that its incoming frames be in order, would identify this requirement. In this way, all frames from each communicating station will be in order.**	Respectfully Declined Strictly ordered class is a per MSDU attribute not a per station attribute

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5	**7.1.3.1.1**	**MT**	**t**		**ref: MT_16** **In the case of a frame having been received with a revision level higher than is supportable, an acknowledgment will not be generated to the sending station (this is not stated but is assumed that no ACK will be sent since the frame is discarded and no indication given to LLC layer). In this case, the sending station will consume unnecessary bandwidth with retries.** **The standard should allow for a more graceful method.** **In the case of a future access point which must simultaneously support multiple versions a cleaner method is required**	**One method with minimal impact to add a Reason Code to clause 7.3.1.7 which states Unrecognized Version or Version Too High and issue a DISASSOCIATION.request to the sending station.** **Another method is to require that all stations negotiate (via the above reason code) the highest common supported version level during association. Then a table must be maintained for each association and assurance that all data is sent at this level.** **For the case of the access point, especially where multicasts and control and management frames are concerned, the access point must insure that these packets are sent at the lowest common revision level of all associated stations.** **A further refinement (and probably necessary) is to guarantee that ALL FUTURE control and management frames are sent at the current revision level, otherwise old equipment will not interoperate with the newer. (if an RTS/CTS exchange is sent at a higher version level, and they are dropped, so much for virtual CCA, etc.)**	**Accept** **Add note that frame from a new protocol version is not ACKed…** **A device that receives a frame with a higher revision level than it supports shall discard the frame without indication to the sending station or LLC.** **Decline body of comment since a receiving station can make no assumptions about even the type of frame it receives (note standard states fundamental incompatibility). Thus there is no basis for a reasonable response.**
6	**7.1.3.1.1**	**TLP**	e		The existing wording is inadequate to handle the relationships among revisions of this standard.	Change "between a new revision and this revision" to "between a new revision and a prior revision".	**Accept**

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7	7.1.3.1.3 7.1.3.1.4 8.x.x.x	MT	T		ref: MT_17 The TO_DS and FROM_DS bits should be allowed to be used in control packets. In particular, these bits could identify a wireless access point which is operating in a repeater function. The repeater upon association to another access point could identify itself as part of the (wireless) distribution system. In this fashion, a Network administrator can establish a security level for the distribution system (such as requiring all data to be WEP encrypted) but stations can be allowed to associate to individual APs using the 'clear mode'. In this case, the AP could filter those 'clear mode' packet requests from the distribution system. Therefore, two stations can communicate in the clear to each other (using the services of the access point and/or distribution system) without having access to any other data from the distribution system.	AUTHENTICATION.request, ASSOCIATION.request frames from a repeater (or Wireless AP) should set the FROM_DS bit to identify themselves as such. Appropriate authentication methods (those as established for the distribution system by a system administrator) can be used. TO FM meaning 0 0 normal STA operation 0 1 repeater associations Appropriate hooks should be provided to allow various levels of security or the standard could simply adopt a single authentication method.	The standard specifies a number of functions that allow a station to support wireless distribution system traffic. What is left to the implementor is the distribution system itself. This comment refers to the distribution system not to the 'media access' part. It is therefore outside the scope of the standard and the comment is respectfully declined
8	7.1.3.1.3 7.1.3.1.4 8.x.x.x	MT	t		ref: MT_18 The use of these bits during the association process (ref MT_17) would enable automatic distribution systems functions. By not defining these bits this way, the standard cannot support interoperability among vendors supplying repeaters. Each vendor will have to resort to proprietary packet exchanges to establish the station as part of the distribution system. I point out the situation of a repeater which has associated one or more power save stations associated to it. The packets must be sent to the repeater for queuing and delivery. Without the standard specifying a way to identify a wireless distribution system component, all this becomes proprietary or	define the bits to be allowed in AUTHENTICATION and ASSOCIATION request frames. Further refinements could be the addition of a required authentication method (as establish via MIB variables of a system administrator, for instance) and automatic conveyance of station capability information.	The standard specifies a number of functions that allow a station to support wireless distribution system traffic. What is left to the implementor is the distribution system itself. This comment refers to the distribution system not to the 'media access' part. It is therefore outside the scope of the standard and the comment is respectfully declined

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					left to another consortium such as the IAPP		
9	7.1.3.1.4 7.1.3.1.3 8.x.x.x	MT	T		ref: MT_17 The TO_DS and FROM_DS bits should be allowed to be used in control packets. In particular, these bits could identify a wireless access point which is operating in a repeater function. The repeater upon association to another access point could identify itself as part of the (wireless) distribution system. In this fashion, a Network administrator can establish a security level for the distribution system (such as requiring all data to be WEP encrypted) but stations can be allowed to associate to individual APs using the 'clear mode'. In this case, the AP could filter those 'clear mode' packet requests from the distribution system. Therefore, two stations can communicate in the clear to each other (using the services of the access point and/or distribution system) without having access to any other data from the distribution system.	AUTHENTICATION.request, ASSOCIATION.request frames from a repeater (or Wireless AP) should set the FROM_DS bit to identify themselves as such. Appropriate authentication methods (those as established for the distribution system by a system administrator) can be used. TO FM meaning 0 0 normal STA operation 0 1 repeater associations Appropriate hooks should be provided to allow various levels of security or the standard could simply adopt a single authentication method.	Respectfully declined (see 7)
10	7.1.3.1.4 7.1.3.1.3 8.x.x.x	MT	t		ref: MT_18 The use of these bits during the association process (ref MT_17) would enable automatic distribution systems functions. By not defining these bits this way, the standard cannot support interoperability among vendors supplying repeaters. Each vendor will have to resort to proprietary packet exchanges to establish the station as part of the distribution system. I point out the situation of a repeater which has associated one or more power save stations associated to it. The packets must be sent to the repeater for queuing and delivery. Without the standard specifying a way to identify a wireless distribution	define the bits to be allowed in AUTHENTICATION and ASSOCIATION request frames. Further refinements could be the addition of a required authentication method (as establish via MIB variables of a system administrator, for instance) and automatic conveyance of station capability information.	Respectfully declined (see 8)

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
					system component, all this becomes proprietary or left to another consortium such as the IAPP		
11	**7.1.3.1.6**	**SD**	**t**		**Nothing is said about the Control Type frame.**	**Add « Control Type frame Retry field is always set to zero.»**	**Accept spirit of comment. Reviewers feel that this clause is missing the 'It shall be set to 0 in all other frames' phrase. Suggest that this be added.**
12	**7.1.3.1.7**	**TLP**	e		The second occurrence of the word "shall" in each of these sentences is incorrect. "Shall" is legislative; "will" is predictive. This sentence and the following sentence make predictions. Therefore "will" is correct in each second occurrence (which is a rare instance in a standard).	Change "shall" to "will" when describing the state in which the station is anticipated to be at some future time. (three occurrences)	**Accept.** **Change made in markup**
13	**7.1.3.1.8**	**AS**	**e**	**y**	**This clause implies that the more data field is only set for directed frames when more MSDUs are present.**	**Change the third sentence in the second paragraph to: "A value of 1 shall indicate that at least one additional buffered MSDU or MMPDU is present for the same STA."**	**One of the many places in the standard where MSDU is stated but what is really meant is MSDU or MMPDU. More than this single change needs to be made within this sub-clause.** **Accept.**
14	**7.1.3.1.8**	**MAF**	**E**	**(na)**	**There is an inconsistency between the blanket statement in 7.1.3.1.8 that "The More Data field shall be set to 0 in all other directed frames." and the allowable (may, not shall) use of the More Data bit in CF-Poll responses (explicitly in clause 9.3.3.5, indirectly in other PCF operation text). This inconsistency seems to have grown progressively since about D2.0, as independent, comment resolution work proceeded in parrallel for clauses 7, 9, and 11.** **The principle that the More Data (then called just "More" because fragmentation had not yet been adopted) was useful for to-AP transfers during the contention free period has been around since the adoption of the proposals in submission 94-283 ("Liberating the More Function") in November, 1994. The text at that time, as well as at the time of**	The More Data field shall be one bit in length and shall be used to indicate to a STA in Power Save mode that more MSDUs are buffered for that STA at the AP. The More Data field shall be valid in directed Data Type frames transmitted by an AP to an STA in Power Save Mode. A value of 1 shall indicate that at least one buffered MSDU is present. <u>The More Data field may be set to a value of 1 in directed Data type frames transmitted by a CF-Pollable STA to the Point Coordinator (AP) in response to a CF-Poll to indicate that the STA has at least one additional buffered MSDU available for transmission in response</u>	**Accept.**

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					the PCF cleanup adopted from submissions 95-140 and 95-150 in July, 1995, did not deal directly with clause 7 (then 4), because the exclusion of other instances of frames with More Data =1 did not yet appear there. The simplification of power save modes was occuring parallel during May and July, 1995, which had a side effect of removing some of the (implicit) supporting text in clause 11 (then 8). **At this point, the simplest, and most direct, way to fix this inconsistency is the text change shown to the right. This correction does not impact fundamental interoperability, because the additional allowed use is not mandatory ("may be set ..."), so a CF-Pollable STA that always transmitted More Data =0 would be able to communicate with an AP that interpreted and used More Data =1 in CF-Poll responses. The same situation pertains in the reverse case of an STA which sets More Data =1 and a point coordinator which does not behave differently when a CF-Poll respone includes More Data =1.**	to a subsequent CF-Poll. The More Data field shall be set to 0 in all other directed frames.	
15	**7.1.3.1.8 2nd ¶**	**TLP**	e		The same wording is needed in both sentences — either buffered broadcast/multicast, or simply broadcast/multicast. I can't tell which was originally intended. However, the use of the word "buffered" may require prefatory explanation, so deletion seems to be the preferred choice.	Change the two paragraphs to use consistent wording.	**Accept.**
16	**7.1.3.2**	**KC**	**t**	**Y**	**In Table 3. "(in microseconds from end of this frame)" the "end of this frame" is not defined and gives no actual physical event from which to start counting time.**	**specify the event that is the timing marker**	**Comment accepted.** **Add text to define end of frame as the end of the last bit of the last octet of the MAC frame.**
17	7.1.3.3	**JMZ**	**e**		The wording is unclear in the last sentence	Change "in the RTS frame" to "in the corresponding RTS frame"	Accept
18	**7.1.3.3.3**	**TLP**	e		You cannot "ensure a high probability".	Change "ensure" to "provide".	**Accept**
19	**7.1.3.3.7**	**TLP**	e		This sentence should end similarly to Source Address above.	Either the text "in the transmitter address" should be added at the end of	**Accept**

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						the paragraph, or the text "in the source address" should be deleted from the end of the prior paragraph.	
20	7.1.3.4	**JMZ**	**e**		Figure 14 is incorrect	"B1" should be "B15"	Decline Figure is consistent with conventions. Also no B1 in figure.
21	**7.2.1.4 7.2.1.5 7.2.1.6**	**TLP**	e		Figures 20 through 22	This picture and the following should be rescaled to 80% x 80%, as are the previous ones.	**Accept - editors point**
22	7.2.2	SB	e	N	Poor use of the Queen's English !	Data frames sent during the contention period shall use the Data Subtypes: Data, or Null Function. Data frames sent by, or in response to polling by, the Point Coordinator during the contention free period shall use the appropriate ~~ones of the~~ Data Subtypes based upon the usage rules	Accept
23	**7.2.2**	**TLP**	e		The acronym IFF is unacceptable.	Change "IFF" to "when".	**IFF means if and only iff - this is not the same as when. Take the acronym out and write if and only iff - then it is not ambiguous.**
24	**7.2.2**	**TLP**	e		first bullet, first item is incorrect	Change "Data+CF-Ack" to "Data+CF-Poll".	**Accept**
25	**7.2.3 7.2.3.9 7.3.2 7.3.2.3**	**WD**	**T**	**Y**	Comment: For Direct Sequence, additional channel number information is needed in BEACON and PROBE-Response frames. Rationale; The defined channels are very overlapping, with a frequency spacing of only 5 MHz. Under normal conditions a receiver listening on channel x will receive a frame transmitted on channel (x +/- 1) (5 MHz apart) or even (x +/- 2) (10 MHz apart) without an error (for short messages). This is a problem in association procedures (roaming, start up). The receiver can not determine what frequency the received frame was	7.2.3.1. Change table 5 6: DS/FH Parameter Set Change note-1: Notes: 1. The DS/FH Parameter Set information element shall only be present within Beacon Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively.	**Partially Accepted DS parameter set.**

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					transmitted, which may subsequently result in wrong channel settings. To solve this the transmitter channel must be made known to the receiver in one way or the other. The most straight forward is to define a DS Parameter Set with channel # information in BEACON and PROBE-Response frames, which is in line with the distribution of the channel information in FH implementations. In this Parameter set also the channels that are actually used in an ESS can be defined, this gives a roaming station the possibility to scan a smaller set of channels.	Section 7.2.3.9, Change Table 12 Entry 6: DS/FH Parameter Set 1. The DS/FH Parameter Set information shall only be present within Probe Response Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.3.2 Add DS Parameter set and give it element ID code 3, and move the subsequent numbers as applicable. Add new section behind 7.3.2.3a 7.3.2.3.a DS Parameter Set The DS Parameter Set element shall contain the set of parameters necessary for channel number information. The information field shall contain Current Channel number and the numbers of the channels used in an ESS. Element ID | Length | Current Channel | ESS Ch Number | octets 1 1 1 0 - 12 Figure 27a, DS Parameter Set Element Format The Current Channel field shall be 1 octets. The ESS Ch Number identifies the Channel numbers that are used in a ESS. The field shall be between 0 and	

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	7.3.2 7.3.2.3				number information is needed in BEACON and PROBE-Response frames. Rationale; The defined channels are very overlapping, with a frequency spacing of only 5 MHz. Under normal conditions a receiver listening on channel x will receive a frame transmitted on channel (x +/- 1) (5 MHz apart) or even (x +/- 2) (10 MHz apart) without an error (for short messages). This is a problem in association procedures (roaming, start up). The receiver can not determine what frequency the received frame was transmitted, which may subsequently result in wrong channel settings. To solve this the transmitter channel must be made known to the receiver in one way or the other. The most straight forward is to define a DS Parameter Set with channel # information in BEACON and PROBE-Response frames, which is in line with the distribution of the channel information in FH implementations. In this Parameter set also the channels that are actually used in an ESS can be defined, this gives a roaming station the possibility to scan a smaller set of channels.	6. DS/FH Parameter Set Notes: 1. The DS/FH Parameter Set information element shall only be present within Beacon Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.2.3.9, Change Table 12 Entry 6: DS/FH Parameter Set 1. The DS/FH Parameter Set information shall only be present within Probe Response Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.3.2 Add DS Parameter set and give it element ID code 3, and move the subsequent numbers as applicable. Add new section behind 7.3.2.3a 7.3.2.3.a DS Parameter Set The DS Parameter Set element shall contain the set of parameters necessary for channel number information. The information field shall contain Current Channel number and the numbers of the channels used in an ESS. Element ID | Length | Current Channel | ESS Ch Number | octets 1 1 1 0 - 12 Figure 27a, DS Parameter Set Element Format The Current Channel field shall be 1 octets. The ESS Ch Number identifies the Channel numbers that are used in a ESS. The field shall be between 0 and 12 octets. If no ESS Ch Numbers is	Disposition/Rebuttal

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26	7.2.3.10	GMG	T	Y	Given that Authentication is considered useless in an environment which does not provide confidentiality, because without confidentiality a station can always pretend to be an other station by using its address as a false identity source address.	Delete the Shared Key Authentication method from the standard, or make it optional also for stations supporting WEP.	Clause 8 issue - deferred
27	7.2.3.2 7.3.1.1 8.1.2	TLP	e		This subclause needs to have wording parallel to the following clauses, as indicated.	Change to read "The Frame Body of a Management Frame of Subtype AUTH shall be:"	Accept
28	7.2.3.9 7.2.3 7.3.2 7.3.2.3	WD	T	Y	Comment: For Direct Sequence, additional channel number information is needed in BEACON and PROBE Response frames. Rationale; The defined channels are very overlapping, with a frequency spacing of only 5 MHz. Under normal conditions a receiver listening on channel x will receive a frame transmitted on channel (x+/- 1) (5 MHz apart) or even (x +/- 2) (10 MHz apart) without an error (for short messages). This is a problem in association procedures (roaming, start up). The receiver can not determine what frequency the received frame was transmitted, which may subsequently result in wrong channel settings. To solve this the transmitter channel must be made known to the receiver in one way or the other. The most straight forward is to define a DS Parameter Set with channel # information in BEACON and PROBE-Response frames, which is in line with the distribution of the channel information in FH implementations. In this Parameter set also the channels that are actually used in an ESS can be defined, this gives a roaming station the possibility to scan a smaller set of channels. **The "Shared Key Authentication" method should be deleted from the standard, because it does not provide any additional authentication level above the "Open System Authentication" with WEP enabled for data transfers.** **Frames that do not have the proper WEP key (ICV is wrong) are not forwarded to the DS.** **The fact that the stations have the proper WEP key that has been distributed (supposedly in a secure way, which is outside the scope of this standard) is an implicit form of authentication.** **Shared Key Authentication depends on both sides having the same WEP key. This is exactly equivalent to the implicit authentication that is achieved with the "Open Authentication", combined with WEP on, for all data traffic.** **This does also rely on both sides having the same correct key.** **Therefore there is no justification for the additional complexity, and or the considerable additional delay during reassociation, or the complexity of the pre-authentication.**	7.2.3.1 Change table 5 6: DS/FH Parameter Set 802.11 currently defines only one defines two subtypes of authentication service; "Open System" and "Shared Key". The subtype invoked is indicated in the body of authentication management frames. Thus authentication frames are self-identifying with respect to authentication algorithm. Change note-1: Notes: 1. The DS/FH Parameter Set information element shall only be present within Beacon Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.2.3.9, Change Table 12 Entry 6: DS/FH Parameter Set 1. The DS/FH Parameter Set information shall only be present within Probe Response Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.3.2 Add DS Parameter set and give it element ID code 3, and move the subsequent numbers as applicable. Add new section behind 7.3.2.3a 7.3.2.3.a DS Parameter Set The DS Parameter Set element shall contain the set of parameters necessary **Therefore delete section 8.1.2 entirely, or make it explicitly optional in section 8.1.2.** **Change Table 14 by deleting all Shared Key entries.** **Change section 7.3.1.1 as follows:** Authentication Algorithm Number = 0: Open System Authentication Algorithm Number = 1: Shared Key All other values of Authentication Number shall be reserved.	See (25)

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						for channel number information. The information field shall contain Current Channel number and the numbers of the channels used in an ESS. Element ID | Length | Current Channel | ESS Ch Number | octets 1 1 1 0 - 12 Figure 27a, DS Parameter Set Element Format The Current Channel field shall be 1 octets. The ESS Ch Number identifies the Channel numbers that are used in a ESS. The field shall be between 0 and 12 octets. If no ESS Ch Number is specified then all Channels are used. If the value of the first octet of the ESS Ch Number field is 0 then only the Current channel is used.	
29	7.3.1 7.1.1,	SB	t	N	Clause 7.1.1 relies on the depiction of fields in diagrams to define the ordering convention: ~~~~~~~~~ The protocol data units (PDUs) in the MAC sublayer are described as a sequence of fields in specific order. *Each figure in clause 7 depicts the fields as they appear in the MAC frame and in the order in which they are transferred, leftmost field first.* The sequence of octets in the fields of the MAC frame forms an octet stream at the MAC/PLCP sublayer boundary. *The leftmost octet in each field of the MAC frame is passed across the MAC/PLCP boundary first.*	Add figures for each of these fields (preferred) or define an ordering convention that does not depend on the depiction of fields in figures. Figures will not fit in this column, but I would be happy to provide them if this comment is accepted.	See (3)

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
					Fields that are longer than a single octet are depicted with the least significant octet on the left. The least significant bit of each octet is defined as bit 0 for that octet and is the leftmost bit of the octet (except the FCS field). Fields that are less than one octet in length are ordered with the least significant bit to the left. ~~~~~~~~~~ Problem is there are no pictures for any of the fixed fields in clause 7.3.1. Therefore the transmission order of the following is undefined: Authentication Algorithm Number Authentication Transaction Sequence Number Beacon Interval Capability Information Current AP Address Listen Interval Reason Code Station ID (SID) Status Code Timestamp		
30	**7.3.1.1 8.1.2** **7.2.3.10**	**GMG**	**T**	**Y**	**Given that Authentication is considered useless in an environment which does not provide confidentiality, because without confidentiality, a station can always pretend to be an other station by using its address as a false identity source address.** **The "Shared Key Authentication" method should be deleted from the standard, because it does not provide any additional authentication level above the "Open System Authentication" with WEP enabled for data transfers.** **Frames that do not have the proper WEP key (ICV is wrong) are not forwarded to the DS.** **The fact that the stations have the proper WEP key**	**Delete the Shared Key Authentication method from the standard, or make it optional also for stations supporting WEP . Change 8.1 as follows:** 802.11 currently defines only one~~defines two~~ subtype~~s~~ of authentication service; "Open System" ~~and "Shared Key"~~. The subtype invoked is indicated in the body of authentication management frames. Thus authentication frames are self identifying with respect to	**See (26)**

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					that has been distributed (supposedly in a secure way, which is outside the scope of this standard) is an implicit form of authentication. **Shared Key Authentication depends on both sides having the same WEP key. This is exactly equivalent to the implicit authentication that is achieved with the "Open Authentication", combined with WEP on, for all data traffic.** **This does also rely on both sides having the same correct key.** **Therefore there is no justification for the additional complexity, and or the considerable additional delay during reassociation, or the complexity of the pre-authentication.**	authentication algorithm. **Therefore delete section 8.1.2 entirely, or make it explicitly optional in section 8.1.2.** **Change Table 14 by deleting all Shared Key entries.** **Change section 7.3.1.1 as follows:** Authentication Algorithm Number = 0: Open System ~~Authentication Algorithm Number = 1: Shared Key~~ All other values of Authentication Number shall be reserved.	
31	**7.3.2 7.2.3 7.2.3.9 7.3.2.3**	**WD**	**T**	**Y**	Comment: For Direct Sequence, additional channel number information is needed in BEACON and PROBE-Response frames. Rationale; The defined channels are very overlapping, with a frequency spacing of only 5 MHz. Under normal conditions a receiver listening on channel x will receive a frame transmitted on channel (x +/- 1) (5 MHz apart) or even (x +/- 2) (10 MHz apart) without an error (for short messages). This is a problem in association procedures (roaming, start up). The receiver can not determine what frequency the received frame was transmitted, which may subsequently result in wrong channel settings. To solve this the transmitter channel must be made known to the receiver in one way or the other. The most	7.2.3.1. Change table 5 6: DS/FH Parameter Set Change note-1: Notes: 1. The DS/FH Parameter Set information element shall only be present within Beacon Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.2.3.9, Change Table 12 Entry 6: DS/FH Parameter Set	**See (25)**

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
					straight forward is to define a DS Parameter Set with channel # information in BEACON and PROBE-Response frames, which is in line with the distribution of the channel information in FH implementations. In this Parameter set also the channels that are actually used in an ESS can be defined, this gives a roaming station the possibility to scan a smaller set of channels.	1. The DS/FH Parameter Set information shall only be present within Probe Response Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.3.2 Add DS Parameter set and give it element ID code 3, and move the subsequent numbers as applicable. Add new section behind 7.3.2.3a 7.3.2.3.a DS Parameter Set The DS Parameter Set element shall contain the set of parameters necessary for channel number information. The information field shall contain Current Channel number and the numbers of the channels used in an ESS. Element ID | Length | Current Channel | ESS Ch Number | octets 1 1 1 0 - 12 Figure 27a, DS Parameter Set Element Format The Current Channel field shall be 1 octets. The ESS Ch Number identifies the Channel numbers that are used in a ESS. The field shall be between 0 and 12 octets. If no ESS Ch Number is specified then all Channels are used. If the value of the first octet of the ESS Ch Number field is 0 then only the	

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
	7.2.3.9 7.3.2.3				number information is needed in BEACON and PROBE-Response frames. Rationale; The defined channels are very overlapping, with a frequency spacing of only 5 MHz. Under normal conditions a receiver listening on channel x will receive a frame transmitted on channel (x +/- 1) (5 MHz apart) or even (x +/- 2) (10 MHz apart) without an error (for short messages). This is a problem in association procedures (roaming, start up). The receiver can not determine what frequency the received frame was transmitted, which may subsequently result in wrong channel settings. To solve this the transmitter channel must be made known to the receiver in one way or the other. The most straight forward is to define a DS Parameter Set with channel # information in BEACON and PROBE-Response frames, which is in line with the distribution of the channel information in FH implementations. In this Parameter set also the channels that are actually used in an ESS can be defined, this gives a roaming station the possibility to scan a smaller set of channels.	6. DS/FH Parameter Set Notes: 1. The DS/FH Parameter Set information element shall only be present within Beacon Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.2.3.9, Change Table 12 Entry 6: DS/FH Parameter Set 1. The DS/FH Parameter Set information shall only be present within Probe Response Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.3.2 Add DS Parameter set and give it element ID code 3, and move the subsequent numbers as applicable. Add new section behind 7.3.2.3a 7.3.2.3.a DS Parameter Set The DS Parameter Set element shall contain the set of parameters necessary for channel number information. The information field shall contain Current Channel number and the numbers of the channels used in an ESS. Element ID | Length | Current Channel | ESS Ch Number | octets 1 1 1 0 - 12 Figure 27a, DS Parameter Set Element Format The Current Channel field shall be 1 octets. The ESS Ch Number identifies the Channel numbers that are used in a ESS. The field shall be between 0 and 12 octets. If no ESS Ch Numbers is	

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32	7.3.2.1	AS	t	y	There appears to be no good technical reason to pad TIM elements so that they are an even number of bytes.	Remove the restriction on N1 and N2 being even.	Accepted
33	7.3.2.1	TLP	e		It would be useful to have a table or figure illustrating the Bitmap Control octet subformat.	Add such a table or figure.	A nice to have but since only two fields (one a single bit field) declined
34	7.3.2.3 7.2.3 7.2.3.9 7.3.2	WD	T	Y	Comment: For Direct Sequence, additional channel number information is needed in BEACON and PROBE-Response frames. Rationale; The defined channels are very overlapping, with a frequency spacing of only 5 MHz. Under normal conditions a receiver listening on channel x will receive a frame transmitted on channel (x +/- 1) (5 MHz apart) or even (x +/- 2) (10 MHz apart) without an error (for short messages). This is a problem in association procedures (roaming, start up). The receiver can not determine what frequency the received frame was transmitted, which may subsequently result in wrong channel settings. To solve this the transmitter channel must be made known to the receiver in one way or the other. The most straight forward is to define a DS Parameter Set with channel # information in BEACON and PROBE-Response frames, which is in line with the distribution of the channel information in FH implementations. In this Parameter set also the channels that are actually used in an ESS can be defined, this gives a roaming station the possibility to scan a smaller set of channels.	7.2.3.1. Change table 5 6: DS/FH Parameter Set Change note-1: Notes: 1. The DS/FH Parameter Set information element shall only be present within Beacon Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.2.3.9, Change Table 12 Entry 6: DS/FH Parameter Set 1. The DS/FH Parameter Set information shall only be present within Probe Response Frames generated by STAs using Direct Sequence or Frequency Hopping Physical Layers respectively. Section 7.3.2 Add DS Parameter set and give it element ID code 3, and move the subsequent numbers as applicable. Add new section behind 7.3.2.3a 7.3.2.3.a DS Parameter Set The DS Parameter Set element shall contain the set of parameters necessary	See (25)

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
						for channel number information. The information field shall contain Current Channel number and the numbers of the channels used in an ESS. Element ID | Length | Current Channel | ESS Ch Number | octets 1 1 1 0 - 12 Figure 27a, DS Parameter Set Element Format The Current Channel field shall be 1 octets. The ESS Ch Number identifies the Channel numbers that are used in a ESS. The field shall be between 0 and 12 octets. If no ESS Ch Number is specified then all Channels are used. If the value of the first octet of the ESS Ch Number field is 0 then only the Current channel is used.	
35	7.3.2.3, 11.1.5, 13.1.4.44, 13.1.4.45, 14.8.2	SB	t	N	Dwell time related MIB attributes are a complete mess in terms of units. 13.1.4.4 defines aMaxDwellTime and aCurrentDwellTime in nanoseconds (!), the default values in 14.8.2 are in milliseconds and the comparison to a TSF timer value in 11.1.5 is to a time in microseconds. Lastly the value for the dwell time in the FH Parameter set element (7.3.2.3) is in Kmicroseconds.	Please can we have some order here. It would be nice if the aMaxDwellTime and aCurrentDwellTime were in Kus since this is what a number of other MAC attributes such as aBeaconPeriod is in. It also ties up with the FH parameter set. It also makes the TSF time comparison easy (hence the beacon stuff). So: aMAXDwellTime should be in Kus and be a default value of 390 (399.360ms)	Accept Needs to be sorted but section 7 is OK it is 11, 13 and 14 that need to be brought into line.

Seq. #	Clause number	your voter's ID code	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Recommended change	Disposition/Rebuttal
						aCurrentDwellTime should be in Kus an be a default value of 20.	
36	**7.x.x.x**	**MT**	**T**		**referencing MT_17 and MT_18, it is noted that support of a wireless distribution must be considered proprietary unless appropriate steps are taken here.** **In addition to the association process being standardized, a wireless access point must have a means to share its 'association table' with access point higher on the network tree. Without the sharing of associated station information up the tree, it is not possible for packets to be efficiently routed.**		**The standard specifies a number of functions that allow a station to support wireless distribution system traffic. What is left to the implementor is the distribution system itself. This comment refers to the distribution system not to the 'media access' part. It is therefore outside the scope of the standard and the comment is declined.**