Collected comments on Section 4 of draft standard D1

4, ch 5, 6, 7	MLT	T	specific timings or time ranges should be defined for all intervals referenced in this chapter	
4.1	CHRIS ZEGELIN		WHERE DID THE DESCRIPTION OF THE BIT / BYTE ORDERING GO TO? IT NEEDS TO BE FOUND FROM PREVIOUS VERSIONS OF THE SPECIFICATIONS. AND REINSERTED INTO THE SPEC.	
4.1.1	Sarosh Vesuna		Figure 4-1 has Sequence Control repeated twice. Remove one of these.	Editorial error.
4.1.1	A. Bolea	E		Order of bit transmission within each octet should be specified.
4.1.1	Bob O'Hara	E	remove second "Sequence Control" block from figure 4-1	figure is incorrect
4.1.1	C. Thomas Baumgartner	e	Correct Figure 4-1 by adding Address 3 and Address 4	The other addresses are defined in 4.1.2.3
4.1.1 Fig 4-1	Jeff Rackowitz	E	Change first Sequence Control to Address 3 and octets = 8.	
4.1.1	Jim Panian	E	Change to a larger frame size. 4 Kbytes is a good figure.	The maximum frame body length of 2304 is not a "standard" mac frame size (see 802.3 or 802.5). Moreover this size could be increased to allow better compression ratio if compression is used. As fragmentation is used, larger maximum frame body length will not translate into an increase of transmission retries.
4.1.1	McKown	E	this & section 1.6 imply MSB is xmitted 1st: should say so explicitly	clarity
4.1.1	Renfro	E	Replace first Sequence Control with Address 3 in figure 4-1.	
4.1.1	Rick White	E	Add the following text: "Figure 4.1 also depicts field length in octets.	
4.1.1	Simon Black	E	First sequence control field should be 'Address 3' in Figure 4-1: MAC Frame Format.	The value of this 'generic' MAC frame diagram is questionable. Suggest that section 4.1 is restructured to have frame formats then field definitions thus: i) Delete section 4.1.1 General Frame Format. ii) Move section 4.2 Frame Types to section 4.1.1 iii) Elements definitions becomes part of 4.1.2 Frame Fields
4.1.1	Okada	E Approve	In figure 4-1, the first Sequence control is changed to Address 3	There are two Sequence Control Fields in Fig 4-1
4.1.1	Jon Rosdahl	E/T	Figure 4-1: MAC Frame Format Frame control (2 octets) Duration/Conn ID (6 octets) Address 1 (6 octets) Address 2 (6 octets) Address 3 (6 octets) Sequence Control (2 octets) Address 4 (6 octets) Frame Body (0-2304 octets) CRC (4 octets)	Extra Sequence control removed. Only one Sequence Control Field is defined. Missing Address 3 field restored.

4.1.1	A. Bolea	T		Duration field should be placed after address 2 and it should not be required in all frame types. Reasons: 1) Duration field is not used in all frame types. 2) We are trying to put address 1 at same position in all frame types and given reason 1, duration field should be moved. 3) Address 1 should come as early as possible in frame to allow an implementation as much time as possible for address filtering. 4) It was argued to place the Duration field in a constant position in frame so that the duration field can always be loaded into a NAV counter. However, the duration field cannot be used until the CRC is validated and message type checked. Therefore the argument that a hardware implementation can always take this field and place it into a NAV counter is not correct. This comment also applies to section 4.2 where all frame types are defined.
4.1.1	A. Bolea	T		Number of octets for Duration field should be changed to 2. First of Sequence control fields should be Address 3 and its octet count should be changed to 6.
4.1.1	bdobyns	T	Figure 4-1 says the sequence control appears twice, taking four octets. This disagrees with figures 4-8 and 4-9.	
4.1.1	C. Heide	T	Figure 4-1: - Duration/ConnID length = 2 octets - Missing Address 3 field following Address 2 field - The second field labeled "Sequence Control" should be removed	figure is wrong
4.1.1	C. Thomas Baumgartner	t	delete second 2 octet Sequence Control field in Figure 4-1	There aren't 2 sequence control fields. Is this where the missing MPDU ID field is supposed to go?
4.1.1	Fischer, Mike.	T	Figure 4Ð1 is out of date. The Duration/Connection ID field is 2 octets in length. There is an Address 3 field (6 octets long) between Address 2 and Sequence Control, and there is only one Sequence Control field. Also, the Address 4 field should be shown as 0 or 6 octets in lenght because if not necessary this field is omitted.	consistency, correctness
4.1.1	Fischer, Mike.	T	The Òframe bodyÓ field can be 0Ð2312 octets in length. Either show this or show a 0-to-2304 octet MSDU, preceded by a 0-or-4 octet IV and followed by a 0-or-4 octet ICV.	consistency, correctness
4.1.1	Glen Sherwood	T	Correct Figure 4-1 to show only one "Sequence Control" field.	Two "Sequence Control" fields are shown in Figure 4-1; I believe there should be only one.
4.1.1	Glen Sherwood	T	Specify correct number of address fields in Fig. 4-1, and define which fields are used for which variables in sec. 4.1.2.3.	Figure 4-1 shows only two address fields. Later text in secs. 4.1.2.3 refers to four address fields, and does not specify where they go in the MAC frame fields.
4.1.1	Joe Kubler	T	fig 4-1 is wrong. The duration/conn id is only 2 octets. The first sequence control is really address 3 and is 6 octets.	
4.1.1	Mark Demange	t	General MAC frame format should include a CRC16 protected header after the Address 4 field (reference figure 4-1)	Protected header serves two purposes: 1. it will assist in HW and SW processing required to get everything done within the SIFS period. 2. It allows the STAs to improve power consumption performance by allowing processing of the incoming frame to cease as soon as the header is received in the event that the frame is not destined for that station.
4.1.1	Renfro	T	Move duration/Conn ID later in frame (after address 2)	Duration field cannot be loaded into NAV counter until after CRC has been checked. Also, more advantage to have address earlier in frame so that time allowed for further processing after address match is maximized.

4.1.1	Renfro	T	Add description of how bits are transmitted (e.g., LSB first). Also, byte transmission order for multibyte fields.	
4.1.1	Rick White	T	Figure 4.1 should only contain a single Sequence Control Field of 2 octets.	
4.1.1	Tim Phipps	T	*Delete this section.*	Figure 4-1 is incorrect (for example, it includes sequence control twice). This section does not add to the standard, it only attempts to duplicate material. This is not a helpful section, anyway, since there is no concept of a "General Frame Format", some common patterns emerge between different frame formats, but the similarities are not strong enough to warrant such a section.
4.1.1	Tom T.	T	Change Figure 4.1 to be the same as Figure 4.8. Expand last sentence to: The order of transmission of the octets of depicted frames shall be from left to right. Fields illustrated to the bit level are shown MS(Byte/bit) to LS(Byte/bit).	Figure 4.1 is incorrect. (I think it is the old format).
4.1.1.	Fischerma:General Frame Format	T	Sequence number field is listed twice in diagram, address 3 field is missing.	
4.1.2.1	Jim Panian	E	Add bits to the frame format to flag a compressed/encrypted frame body.	There is no flag specifying if the frame is compressed and/or encrypted. Such bits would ease protocol implementation, either in software or in hardware.
4.1.2.1	C. Heide	t	clarify in what frames the fields "last fragment", "retry" and "power management" are valid	clarification
4.1.2.1	Joe Kubler	T	fig 4-2 does not include a "more" bit. Since the only bit left is "Rsvd", it should be "more"	as discussed in section 7.2.1.6 and 7.2.1.7.
4.1.2.1	McDonald	t	Are 2 bits enough?	What is a fundamental incompatibility? When and how is it determined that a fundamental incompatibility exists? Are two bits enough?
4.1.2.1	Wim Diepstraten	T	It should be made clear which of the FC bits are relevant in which frame types. The following should be added: - Protocol version, Type and Subtype are relevant in all frame types. - To_DS and From_DS are relevant in Data frames only. - Last_Frag and Retry are only relevant in Data andManagement frames. - Power Management bits are relevant in Data and Ack frames. - EP is only relevant in Data and Management frames.	The Power management bits need to be relevant in both the data and Ack frames, to allow efficient dynamic mode switching between the power save modes and the TAM mode.
4.1.2.1 and new section 4.1.2.1.9	Fischer, Mike.	T	Change ÔRsvdÓ bit to ÔWEPÓ in figure 4Ð2. Add section to describe this bit as: ÒThis one-bit field shall be set (=1) to indicate that the frame body contains an MSDU, or fragment thereof, encrypted using the MAC WEP function. Whenever this bit is set, the first 4 octets following the MAC header in the first, or only, fragment of the MSDU shall be interpreted as a WEP Initialization Vector (IV) field and the last 4 octets before the CRC field in the final, or only, fragment of the MSDU shall be interpreted as a WEP Integrity Check Value (ICV), as described in section 5.8. Whever this bit is clear, no WEP processing shall be applied to the frame body. This bit must be set to the same value on all fragments of each MSDU. This bit must always be clear on control and management frames.Ó	this follows the recommendations adopted in the MAC WEP session at the January, 1995 Interim meeting and reported in document 95/06.
4.1.2.1.1	Jim Panian	E	Add more bits for protocol version. The introduction of such bits will certainly ask for a new byte in the control field, but this control field needs to also be extended for other reasons (see next comment).	2 bits for protocol version does not seem sufficient.
4.1.2.1.1	Rick White	T	State that for this version of the draft, the Protocol Version shall be B'00.	Protocol version for this version of standard must be defined.
4.1.2.1.1, also 4.1.2.1.6	Fischer, Mike.	T	At end of last sentence add Òwithout indication to LLC.Ó	clarity

4.1.2.1.1.	Sarosh Vesuna		Change the last sentence as follows. "A device that receives a frame with a higher revision level than it can understand ***may*** discard the frame."	The word "shall" in the current text will require the frame to be discarded. This is not necessary if proper use of element fields is made for future revisions. The device may then only discard the element fields that it does not understand, not the entire frame.
4.1.2.1.2	C. Heide	E	Table 4-1 should have another column which has class number to correlate with the state information in section 2.5	clarity
4.1.2.1.2	bdobyns	T	Modify the Type/Subtype allocations so that the types are as follows: Type - meaning 00 - no response frame expected to this one (e.g. broadcast, beacon) 01 - RTS response frame expected to this one (e.g. CTS) 10 - DATA response frame expected to this one (e.g. RTS, POLL, Data+CF-x) 11 - ACK response frame expected to this one (e.g. Management, UniData)	At higher speeds (than 1 or 2 Mbps) the timely fabrication of the response frames will be more critical than it is now. This makes for a simpler non-software implementation of the response frame.
4.1.2.1.2	C. Heide	t	drop the word "asynchronous" from the "Asynchronous Data" frame type	data is data in this case
4.1.2.1.2	C. Thomas Baumgartner	t	Change Type from Asynchronous Data to Data. Change Subtype from Data to Asynchronous Data. Check how this ripples through the entire document	Since the "data" type contains both asynchronous data sub-type and time-bounded data sub-type then its name MUST change. In most of the rest of the document uses the name Asynchronous Data to mean the contention-based data type not both types. In most of the rest of the document the Type is given as Data not Asynchronous Data.
4.1.2.1.2	Mark Demange	t	Insufficient reserved Management frames. Suggest combining association and reassociation requests. Suggest combining association and reassociation responses.	Association and reassociations will happen infrequently relative to all other traffic occurrences in a BSS/ESS thus the additional overhead of combining the frames is insignificant.
4.1.2.1.2	Tim Phipps	T	Add: "Type = 01, Type description = control, Subtype value = 0000, CF END + Ack".	The CF END packet must have the option to acknowledge, or not acknowledge, the previous MPDU. Hence there is a need for a "CF END + Ack" as well as a "CF END".
4.1.2.1.2	Wim Diepstraten	T	The table should include a code for CF-TBS. This is needed to identify when the second field in the frame header should be interpreted as Conn-ID rather then DUR. (see section 4.1.2.2)	The question is why the Conn-ID needs to be part of the Header anyway, sinse the address fields are still part of that Header.
4.1.2.1.2, 4.2.1.4, several subsequent places (can be easily text searched by the editors)	Fischer, Mike.	T	(recommendation): Change the name of the ÒPollÓ frame to ÒPowerSave PollÓ (globally, starting in Table 4Ð1)	There is considerable confusion, even among members of the MAC group, over the two different (unrelated) things called ÒpollÓ in this MAC. One is polling by a very low power station to request buffered traffic from the AP while powered up and able to receive such traffic. This is the use for the ÒPollÓ control frame, and can be made clearer with this name change. The other is the invitations to transmit by the PCF during the contentionÐfree period. These have already been renamed CPÐPoll in the current draft.

4.1.2.1.2.	P. Brenner	T	Merge the following Subtypes into one single subtype: Association Request Association Response Reassociation Request Reassociation Response Privacy Request Privacy Response Disassociation Authentication Connection Request Grant Connection End Connection	According to the MAC Architecture Block Diagram in Figure 5-1 all these Frames are treated identically in the MAC and MAC Management State Machines, and are handled by the MAC Management Service. So it does not make sense to add all this information to the MAC Subtype header. It should be noted also that there are almost no Reserved Subtypes in the Management Type, so we will probably need. It could be argued that the Management Subtypes could grow into the Control Type (this is probably the reason why the Control Subtypes start from 1011), this is not a good idea since the Control Packets are to be handled at the MAC State Machine, and any Reserved Control Packet should be rejected at this level, while the Management Type packets are handled in an upper layer (so the MAC State Machine must forward all unknown Management packets)
4.1.2.1.3	bdobyns	T	Problem with To_DS: Not specifying the algorithm for setting and resetting To_DS in a STA can lead to guaranteed out-of-sequence packets. Duplicate rejection sequence numbers don't help here.	Consider two STA which are at the 'fringe' of being in range. Sometimes they can communicate. Sometimes they can't. One STA decides to reach the other via To_DS=1 and sends frames 1,2,3,4. The other uses To_DS=0 and sends frames a,b,c,d. The first then decides (hey! he received a,b,c,d with ToDS=0!) that it can communicate directly, sending 5,6,7,8 with To_DS=0. Meanwhile the first four frames have been making their way through the DS. Now frames 1,2,3,4 are delivered - after 8 and out of sequence (maybe even by a different AP).
4.1.2.1.3	C. Heide	t	clarify how a STA knows when to use the TO DS field.	how does a STA know the physical location of the STA to which it wishes to send, i.e. whether it is wireless or wired?
4.1.2.1.3	C. Thomas Baumgartner	t	More explanation of how the STA knows when to set this bit is required.	How does a STA know whether it needs to set the To DS bit? Presumably it would not set this bit if the destination STA is in its BSS. How would it know this? How would it know if destination STA moves to another BSS?
4.1.2.1.3	Mark Demange	t	Needs a cross reference to the place in the draft that describes how a station knows how to set the to DS bit. Example: How does a STA know whether the destination of its packet is to the DS or to another STA in the same BSS?	
4.1.2.1.3	Rick White	T	Any frame that is directed to another STA must have the DS bit set.	This is true for any frame for which the source can not directly communicate with the destination.
4.1.2.1.4	A. Bolea	E		WDS is not defined at this point in the text. True and False should be changed to 1 and 0 to be consistent.
4.1.2.1.4	C. Heide	E	Add WDS to acronym section OR expand and explain in this section	Table 4-2 uses WDS acronym which is undefined at this point
4.1.2.1.4	Glen Sherwood	E	Define WDS (wireless distribution system).	WDS is not defined before being used.
4.1.2.1.4	Miceli	E	WDS should be defined in Section 1.3 - Abbreviations	This abbreviation is used without having been defined
4.1.2.1.4	Rick White	E	Add definition and Abbreviations of "From/To DS" to Sections 1.2 and 1.3 respectively	
4.1.2.1.4	Mark Demange	t	Needs a cross reference to the place in the draft that describes how a station knows how to set the to DS bit. Example: How does a STA know whether the destination of its packet is to the DS or to another STA in the same BSS?	
4.1.2.1.4	Rick White	T	A Distribution System does not require an infrastructure network.	A stand-alone BSS with an AP can have a DS.
4.1.2.1.4 (table 4Ð2)	Fischer, Mike.	T	In first row of table, add notation at end Òin same BSSÓ	when both ToDS and FromDS =0, the frame will not leave the BSS via the DS, so the use should be explicitly indicated to be intraÐBSS.

4.1.2.1.5	A. Bolea	E		Should specify that 1 means last fragment and 0 etc. I know I'm being picky here but this is a standard! Same is true of section 4.1.2.1.6.
4.1.2.1.5	C. Thomas Baumgartner	t	Add "valid only for data frames"	One assumes that only data frames are large enough to require fragmentation so this bit only useful for data frames.
4.1.2.1.5	Mark Demange	t	Need to define 1= Last fragment and 0 = more fragments following	Undefined values for necessary field is inappropriate for a standard.
4.1.2.1.5	Rick White	T	The state of the bit must be defined so that one can determine if it is the last fragment.	Does the bit = 0 or 1 for the last fragment?
4.1.2.1.6	Joe Kubler	T	may ->shall	all stations should use the bit the same way, not willy nilly
4.1.2.1.6	Mark Demange	t	Need to define 1= retry and 0 = first transmission	Undefined values for necessary field is inappropriate for a standard.
4.1.2.1.6	Rick White	T	The state of the bit must be defined so that one can determine if the frame is a retransmission.	Does the bit = 0 or 1 for a retry?
4.1.2.1.7	Sarosh Vesuna		Values in this field are given in table 4-3.	Editorial error.
4.1.2.1.7	A. Bolea	E	**"table 4-2"** should be **"table 4-3"**	
4.1.2.1.7	Geiger	E	CAM and TAM definitions are missing Add to abbreviation table	Not clear what these mean
4.1.2.1.7	Glen Sherwood	E	Change ref. to table to "...Table 4-3".	Typo.
4.1.2.1.7	Jeff Rackowitz	E	Table 4-3	
4.1.2.1.7	Mark Demange	e	Incorrect cross reference. Should be "table 4-3"	
4.1.2.1.7	Rick White	E	The values of the Power Management field are given in Table 4.2 not 4.3.	
4.1.2.1.7	Bob O'Hara	T	add: "These bits shall remain constant for each frame sequence described in section 4.3."	Power management state must not be allowed to change "on the fly", i.e between RTS and DATA or in similar frame sequences. To change power management state, a station must send a frame (preferrably management type) for the sole purpose of power management.
4.1.2.1.8	C. Heide	t	replace last two sentences with "Elements are only present in management frames. Certain subtypes of management frames contain certain element, as defined in section 4.2.3"	as written it is wrong
4.1.2.1.8	C. Heide	t	remove the EP field	elements can only be present in management frames and they are the only thing in management frames. This field is not needed.
4.1.2.1.8	C. Thomas Baumgartner	t	Change "Elements Present" bit to Reserved	4.2.3 says that Elements can only be used in Management frames. Further subparagraphs detail exactly what elements are in each sub-type. This renders the EP bit redundant.
4.1.2.1.8	Jon Rosdahl	T	This one bit field shall indicate that there are one or more "elements" present in the frame body. This field shall be used for Management type frames. The use of this field is reserved for all other frame types.	The use of elements was intended to allow for expanding management issues. This rewording of the paragraph makes th clear.
4.1.2.2	Sarosh Vesuna		Note: only contention free time-bounded data use a connection ID;	Editorial error
4.1.2.2	A. Bolea	E	"time-bounded data used .." should be "time-bounded data use..."	Did not see a section 5.xx detailing how the duration field is calculated.
4.1.2.2	C. Thomas Baumgartner	e	complete reference to 5.xx	I can't determine the correct reference from section titles.
4.1.2.2	Geiger	E	Duration Field is described as a 16 bit field, leading one to believe it is 2 octets. Figure 4-1 shows it to be 6 octets. 5.xx is missing	Resolve

4.1.2.2	Jeff Rackowitz	E	The 16-bit duration field is not defined. 5.2.6.4 was the only paragraph in section 5.XX dealing with the duration field and it was not defined. Since the duration field is 16-bits should the other four octets be don't cares?	
4.1.2.2	Joe Kubler	E	5.xx should be 5.2.6.4	
4.1.2.2	Lewis	E	replace 5.xx with appropriate section	
4.1.2.2	Mark Demange	e	Update cross reference "5.xx" to proper value.	
4.1.2.2	Renfro	E	Update reference to section 5.x.x	
4.1.2.2	Bob O'Hara	T	Change timing to be in bit times not microseconds	Though not a problem in current PHYs that have a one microsecond bit time, it may be overly complex or expensive to provide a 1 MHz reference in future revisions of the standard.
4.1.2.2	C. Heide	t	remove the last sentence, the one in brackets.	there is no definition of "time bounded data", what it is or when it is generated. There is a "contention free connection" service available, but no restriction or definition of what type of data can be passed over it.
4.1.2.2	C. Thomas Baumgartner	t	Specify exactly which frame type(s) have the Connection ID when.	The note in the paragraph doesn't make clear which frame types it is talking about. The previous sentence uses the word "may" so that one is left to believe that it is optional. This will not provide for interoperability.
4.1.2.2	Fischer, Mike.	T	last sentence should read Òonly contention free timeÐbounded service frames use a connection ID; asynchronous data frames do not use connection Ids).Ó also: the reference to Òsection 5.xxÓ has no extant target Ñ in providing the calculation information, the correct place is probably in each of the PHY specifications, because of differing techniques needed for different PHYs (due to bit stuffing in the FHSS PHY, different points at which data rate change occurs when certain PHYs are told to transmit at their higher rate, etc).	completeness, clarification of the fact that asynchronous data service is one service class whether the frames are delivered in the contention period or the contention free period
4.1.2.2	Joe Kubler	T	cannot tell when duration is connection in CF frames. should define duration to be all ones in CF-async or some other value to distinguish it from a connection id.	CF can contain Time Bounded and async data. a TB stations could be confused by a duration field in CF-async data.
4.1.2.2	McDonald	t	Define 5.xx Is duration in octets or microsecs	How does Mac know microseconds?
4.1.2.2	Miceli	T	Duration field calculation not specified	needed for correct system operation
4.1.2.2	Rick White	T	Must determine the actual Section number in Section 5 that defines the calculation of the value for the duration field.	I could not find any information in Section 5 that defines how the value of the duration is calculated. This must be defined.
4.1.2.2	Rick White	T	Duration/Conn ID field is defined as 16-bits (2 octets) but Figure 4-1 indicates 6 octets (48-bits).	Which is correct? (Note: Check motions from Lake Tahoe Meeting.)
4.1.2.2	Wim Diepstraten	T	Why is the Conn_ID part of the Header, sinse the address fields are there for proper destination filtering? It should be made clear which (Sub)-Type will have a Conn-ID field rather then a DUR field.	What is the function of the Conn-ID field? Is it to be used for filtering?
4.1.2.3	Sarosh Vesuna		Remove the word "variously" from the second sentence	This word seems out of place.
4.1.2.3	Rick White	E	Must contain diagram of the bits in the Address field. This can probably be taken from 802-1990.	Completeness
4.1.2.3	Geiger	T	Figure 4-1 shows three address fields, this section claims 4	Resolve
4.1.2.3.1	A. Bolea	E		The explanation from 20b3 regarding the bit ordering and transmission of the address field was removed from this draft. It should be replaced and made even clearer!
4.1.2.3.1	Tom T.	E	Does IEEE Std 802-1990 indicate byte ordering of the address?	

4.1.2.3.1	A. Bolea	T		With an incrementing number for the Dialog Token, we need to specify that each station randomly selects the starting value when it joins a network. This minimizes the chances of two stations having matching numbers. Alternatively, we could define this field to be a random number. This would perform better than an incrementing value.
4.1.2.3.2	Mark Demange	e	Need to define how to identify a multicast-group address. Least significant bit of most significant byte.	
4.1.2.3.2	McKown	E	what body?	clarity
4.1.2.3.2	Fischer, Mike.	T	suggest that last sentence of (2) be deleted	I see no benefit in allowing stations that cannot send broadcast frames. Since many of the common higher layer protocols depend on broadcasts in certain cases, this would allow the creation of network interfaces that could not support facilities expected by common protocol stacks.
4.1.2.3.2	Geiger	T	2) .... ~~It is not necessary that a station be capable of generating a broadcast address.~~	This statement is meaningless, remove it.
4.1.2.3.3	Rick White	E	¶ 1: Infrastructure LAN should be changed to Infrastructure Network - 2 occurrences.	
4.1.2.3.3	Tim Phipps	E	*Replace:* "This field shall be a locally-administered group address". With: "This field shall be a unique MAC or locally-administered group address".	One obvious choice of ad-hoc BSS-ID is the MAC address of the station which starts the BSS. The original form of words does not allow this.
4.1.2.3.3	Geiger	T	Measures shall be taken in the selection of the value of this field to differentiate it from other ad hoc LANs in the vicinity.	What Measures?
4.1.2.3.3	Glen Sherwood	T	Define algorithm for selecting BSSID values.	The term "Measures shall be taken in the selection of the value of this field [BSSID] to differentiate it from other ad hoc LANs in the vicinity", does not constitute a designable algorithm.
4.1.2.3.3	Rick White	T	¶ 1: The value of the BSSID shall be the MAC Address of the STA in the AP of the BSS.	The AP could have another MAC address for the DS. The address must be that of the 802.11 MAC.
4.1.2.3.4	Fischer, Mike.	T	The destination address (DA) field shall contain an IEEE MAC individual or group address that identifies the MAC entity or entities intended as the recipient(s) of the MSDU (or fragment thereof) contained in the frame body field.	precision of specification (since we have 4 address fields and need to be very clear about the role of each kine of address)
4.1.2.3.4.	Sarosh Vesuna		"addresses has an extra "e"	Editorial
4.1.2.3.5	Fischer, Mike.	T	The source address (SA) field shall contain an IEEE MAC individual address that identifies the station from which the transfer of the MSDU (or fragment thereof) contained in the frame body field was initiated.	precision of specification (since we have 4 address fields and need to be very clear about the role of each kine of address)
4.1.2.3.6	Jon Rosdahl	E/T	The Receiver Address (RA) field shall identify the destination address of the immediate recipient of a wireless transmission. The Indivual/Group bit shall always be transmitted as a zero.	Clearify the paragraph, and make consistent with the other definitions.
4.1.2.3.6	Fischer, Mike.	T	The receiver address (RA) field shall contain an IEEE MAC individual address that identifies the intended recipient station, on the wireless medium, for the MPDU contained in the frame body field..	precision of specification (since we have 4 address fields and need to be very clear about the role of each kine of address)
4.1.2.3.6	Rick White	T	The RA must be an IEEE MAC Address of a STA (802.11 device).	A STA can only transmit to another station. Otherwise it is passed to the DS.
4.1.2.3.6 - 4.1.2.3.7	C. Heide	t	more fully specify RA and DA	in many cases RA = DA, and SA = TA. For instance, in To_DS data from a STA using RTS/CTS, the DA/SA in the control:RTS frame have different meaning than the DA/SA in the data:DATA frame.
4.1.2.3.6 - 4.1.2.3.7	C. Heide	t	remove restriction of no broadcast in TA and RA	broadcast data on wired network from a wired station that the AP is broadcasting - doesn't that have a SA=wired station, TA=AP, RA=broadcast and DA=broadcast?

4.1.2.3.6.	P. Brenner	T	The Receiver Address Individual/Group bit should not be restricted to be zero	In a Wireless Distribution System it may be adequate to "forward" a multicast frame to several APs by using a Multicast RA.
4.1.2.3.7	Jon Rosdahl	E/T	The Transmitter Address (TA) field identifies the station from which the frame was last tranmitted. The Individual/Group bit shall always be transmitted as a zero.	Clearify the paragraph, and make consistent with the other definitions.
4.1.2.3.7	Fischer, Mike.	T	The transmitter address (TA) field shall contain an IEEE MAC individual address that identifies the station which transmitted, onto the wireless medium, the MPDU contained in the frame body field.	precision of specification (since we have 4 address fields and need to be very clear about the role of each kine of address)
4.1.2.3.7	Rick White	T	The TA must be an IEEE MAC Address of a STA (802.11 device).	A STA can only transmit to another station. Otherwise it is passed to the DS.
4.1.2.4	CHRIS ZEGELIN		IF THE FRAGMENT NUMBER IS CHANGED TO INDICATE THE NUMBER OF REMAINING FRAGMENTS FOR THE MSDU, THEN THE LAST FRAG BIT IN THE FRAME CONTROL FIELD WOULD NO LONGER BE NEEDED.	
4.1.2.4	bdobyns	T	Sequence control field is not long enough. should be on the order of (4 seconds/average frame duration), which is much larger than 4096 for PHY within our PAR (e.g. 20Mbps, or even 10Mbps). 4096 is dangerously small even for low speed PHY. As an alternative require sequence to be maintained on a per-DA basis.	4 seconds is the normative time-to-live value in a bridged network. it is used as a stalking horse here for lack of a better number. Note that a busy AP could roll over the 12-bit sequence number (especially if it is not maintained on a per-DA basis) several times per second at 1 or 2 Mbps.
4.1.2.4	Rick White	T	Change Dialog Token to Sequence Number.	More descriptive of its function
4.1.2.4.1	bdobyns	E	replace "incrementing" with "monotonically increasing" in the first sentence	
4.1.2.4.1	Bob O'Hara	E	delete the words "sequence number" in the last sentence.	Redundant
4.1.2.4.1	Jeff Rackowitz	E	Paragraphs 5.2.11, 5.6, 5.5, 5.8.2.2 call this field MSDU_ID and MPDU_ID. This paragraph calls this field Dialog Token. We should pick one name and use throughout.	
4.1.2.4.1	Jon Rosdahl	E	...The format of this filed si shown in figure 4-4.	Add to the end of the current paragraph.
4.1.2.4.1	bdobyns	T	Not clear whether this value is the same for all DA's or is unique on a per-DA basis. Standard should explicitly permit both.	better protection against false duplicate rejection
4.1.2.4.1	Fischer, Mike.	T	in last line add Òwith the Retry frame control bit set to 1Ó at the end of the sentence	clarity
4.1.2.4.1	Renfro	T		Having dialog token starting at zero and incrementing for each transmission may result in several stations with approximately the same dialog token at any given time. This can result in lost frames if two stations with the same token attempt to transfer data to a third station (i.e., AP). A better approach would be to have the dialog token begin at a random number and then increment. The best approach would be to make the dialog token a random number which is updated with each transmission. This would avoid two stations getting their dialog token values in sync. It may be reasonable to only suggest an implementation instead of specify the approach. A transmitting station may actually pick the dialog token however it likes. A receiving station will have to keep track of the value however it is assigned.
4.1.2.4.1	Rick White	T	Change Dialog Token to Sequence Number.	More descriptive of its function
4.1.2.4.2	A. Bolea	E		Figure 4-4 does not exist. This reference should be moved to section 4.1.2.4 and it should be figure 4-3.
4.1.2.4.2	Joe Kubler	E	fig 4-4 should be fig 4-3	
4.1.2.4.2	Miceli	E	"The format of this field is shown in Figure 4.3"	existing text references incorrect figure
4.1.2.4.2	Renfro	E	Reference to figure 4-4 is incorrect.	
4.1.2.4.2	Rick White	E	There is no Figure 4-4 with reference to Frame Number. Figure 4-4 is an RTS frame.	

4.1.2.4.2	Fischer, Mike.	T	replace the middle sentence with ÒThe fragment number shall be transmitted as 0 in the first or only frame of an MSDU and shall be incremented by 1 for each successive fragment of a fragmented MSDU.Ó	clarity
4.1.2.4.2	Jeff Rackowitz	T	Increase to 5 or 6 bits.	Assuming a 2000 octet MSDU, the smallest size fragment is 125 octets. If the fragments are smaller (done by adding a couple of bits to the fragment number) the last fragment of a dwell time has a chance of being transmitted before the dwell boundary. A couple of bits for more bandwidth seems like a good choice.
4.1.2.4.2	Renfro	T		Need to add definition of field for first fragment. Is it 0000 or 0001?
4.1.2.4.2	Rick White	T	Must define value of Fragment Number field. Add text: "The Fragment Number field is a binary representation of the fragment number. The first fragment is represented as B'0000. Subsequent fragments of the same MSDU will be increment the Fragment Number Field."	Not defined.
4.1.2.4.2	Tim Phipps	T	The Fragment Number is a 4-bit field. It shall indicate the number of each individual fragment. The format of this field is shown in figure 4-3. Fragments are numbered sequentially starting at zero.	The specification, wrongly, said figure 4-4, not figure 4-3. The start offset for fragment numbering should be specified clearly in this section, I believe that zero is the best start offset to chose.
4.1.2.4.2.	Sarosh Vesuna		At the end of this section add the following text. "The first fragmentis numbered as 1".	This will clarify an ambiguity as to whether the first fragment is numbered as 0 or 1.
4.1.2.5	Rick White	E	Change bytes to octets.	
4.1.2.5	Fischer, Mike.	T	The frame body is a variable lenth field that may vary from zero to 2312 octets. Of these up to 2304 octets can be an MSDU or frameÐtypeÐspecific information in management frames. The remaining 8 octets are only present in data frames and only when WEP is in use, as indicated by the WEP frame control bit being set. The use of these 8 octets is described in section 5.4.	consistency with WEP details
4.1.2.5 3.2.1.2,	bdobyns	T	Requires explanation of source for 2304 as a value. e.g. $2304 = \left(\frac{7!}{2} - 6^3\right)$ where: 7 = the number of drafts of the standard before final approval 6 = the number of years to approve the standard 3 = the number of PHY types in the standard 2 = the maximum data rate the standard actually supports	another possible explanation is: $2304 = \left(\frac{2^5 + 2^6}{2}\right)^2$
4.1.2.6	Sarosh Vesuna		Add the following at the end. " f) The CRC is transmitted with the MSB first; i.e. bit 32 is shifted out first". Following theis sentence also add the text of the CRC from 802.4 specifying the initial value of the shifters & the value of the remainder.	To remove ambiguity.
4.1.2.6	A. Bolea	E		The CCITT Standard should be referenced. In addition, the HEC and CRC algorithms should be specified in the same manner. Currently the wording style is substantially different.
4.1.2.6	Fischer, Mike.	T	second sentence should state ÒCRC coverage shall start with the first bit of the protocol version field and extend through the last bit of the last octet preceding the CRC field.Ó	clarity, applicability to control frames (which lack a frame body) as well as data and management frames
4.1.2.6	Geiger	T	Replace CRC text with text found on page 164 of IEEE 802.6-1990 or the CRC description found in the FDDI specification.	First, the initial remainder is set to all ones, what is the purpose of complimenting the first 32 bits of the frame?
4.1.2.6	Greg Smith	T	The initial CRC value =0xffff or =0x0000	This needs to be stated
4.1.2.6	Tom T.	T	Add line stating: Octets are transmitted MSB to LSB.	If not stated explicitly will result in ambiguity.

4.2	Renfro	T	Move Duration Field to later (after second address).	This makes much more sense. The duration information may or may not be useful in a given frame and cannot be used until the CRC passes anyway. To ensure that stations can respond as required within a SIFS time, having the address which must be checked appear as early as possible in frame gives the NIC more time to prepare the appropriate response.
4.2.1	C. Heide	E	There should be a forward section reference on "SIFS interval".	at this point SIFS interval is meaningless
4.2.1	Geiger	E	How about adding the octet size of each field in figure 4-4, 4-5, 4-6, 4-7, 4-8	So everyone can get a much better look at the overhead associated with this standard.
4.2.1.1	Rick White	E	Figure 4-4 should indicate the length, in octets, of each field.	
4.2.1.1	Rick White	E	Change "Infrastructure LAN" to "Infrastructure Network".	
4.2.1.1	Rick White	E	Change "ad hoc LAN" to "ad hoc network".	
4.2.1.1	Rick White	E	The DA should be the address of the STA contained in the AP.	The AP could have another MAC address for the DS. The address must be that of the 802.11 MAC.
4.2.1.1	Wim Diepstraten	E	Section below figure 4-4: It should be clarified that RTS is also used for direct station-to-station traffic, also in an infrastructure LAN.	The text does imply that in an Infrastructure the RTS is only used for transmisiion to the DA. STA-STA and AP-STA is however also possible.
4.2.1.1	A. Bolea	T		Description of DA in Infrastructure networks implies that all data goes through AP and that STA-STA data is not allowed. We should not preclude STA-STA traffic in Infrastructure networks.
4.2.1.1	Fischer, Mike.	T	The addressing would be easier to understand if the address fields were designated RA and TA, because these fields always are individual stations on the WM, which is a property of RA and TA, as defined (correctly, per my comments above) but not necessarily properties of DA and SA. Then have the descriptive text state: ÒThe RA of this frame shall be the address of the STA, on the WM, of the intended recipient of a pending, directed Data frame. This may not be equivalent to the subsequent DA of the Data frame on infrastructure LANs, where RTS frames sent by nonÐAP stations shall contain an RA that designates the AP with which the STA is associated in cases where the subsequent Data frame is being sent to distribution services (ToDS=1 in the Data frame). In Ad-hoc LANs, the RA shall always equal the DA of the subsequent Data frame. The SA shall always be the address of the station transmitting the RTS frame. ToDS and FromDS shall always be =0 in RTS frames.	precision
4.2.1.1	Joe Kuber	T	after the figure replace text up to but not including the sentance about "The SA" with "The DA shall be the address of the destination of the subsequent data or management frame.	the discussion implies that directed mpdus in a BSS managed by an AP are not possible or that the AP must do the reservation acknowledgements. I do not believe we eliminated directed frames with AP help in any session.
4.2.1.1	Rick White	T	Must define the Frame Control field on a bit-by-bit basis for an RTS frame.	Makes Standard much clearer. Better chance of interoperability.
4.2.1.1	Rick White	T	Must define how the Duration field is calculated.	
4.2.1.1.	P. Brenner	E	Remove the sentence: "In an infrastructure LAN the DA shall be the address of the AP with which the station is associated"	This leads to the assumption that there are no directed frames.
4.2.1.1.	Fischerma:RTS Frame Format	T	fields DA and SA should be changed to RA and TA, respectively	While it is true that for unforwarded traffic, RA=DA, SA=TA, the equalities are NOT true for frames that must be forwarded. Therefore, for control frames, RA and TA are better name choices for the fields.
4.2.1.2	Rick White	E	Figure 4-5 should indicate the length, in octets, of each field.	
4.2.1.2	Greg Smith	E/T	CTS frame should contain SA information (or MPDU_ID) see 5.8.2.2	To ensure the CTS is from the correct station
4.2.1.2	Fischer, Mike.	T	The addressing would be easier to understand if the address was designated RA, which is always a unicast address of a station on the WM, which is not necssarily a property of DA. Also, the text should state ÒThe receiver address of the CTS frame shall be copied from the transmitter address field of the immediately previous RTS frame to whcih this CTS is a response.Ó	precision

4.2.1.2	Jon Rosdahl	T	The frame format for the CTS frame is shown in Figure 4-5. Figure 4-5: CTS Frame (Text view of the graphic) FrameControl (2 octets) Duration (6 octets) DA (6 octets) SA (6 octets) CRC (4 octets) The destination address of the CTS frame shall be taken from the source address field of the RTS frame to which the CTS is a response.		The Source address was not included. The source address is required to be present in all frames to perform complete independant Network Management.
4.2.1.2	Rick White	T	Must define the Frame Control field on a bit-by-bit basis for a CTS frame.		Makes Standard much clearer. Better chance of interoperability.
4.2.1.2	Rick White	T	Must define how the Duration field is calculated.		
4.2.1.2, 4.2.1.3 and 8.1.2	D. Johnson	T	Document 11-94 / 259a has acceptable wording.	The MAC, to be universal, should have a mechanism for implementing transmitter power control even if the presently specified PHYs cannot implement it. Preliminary studies show that at least 2:1 throughput density per Hertz of bandwidth can be achieved with power control. The scarcity of spectrum dictates that a method must be available to achieve this added throughput capability as technology advances. This is one of the reasons for the no vote.	
4.2.1.2.	Fischerma:CTS Frame Format	T	fields DA and SA should be changed to RA and TA, respectively		While it is true that for unforwarded traffic, RA=DA, SA=TA, the equalities are NOT true for frames that must be forwarded. Therefore, for control frames, RA and TA are better name choices for the fields.
4.2.1.3	Rick White	E	Figure 4-6 should indicate the length, in octets, of each field.		
4.2.1.3	Rick White	E	Change "previous Data" to "previous Asynchronous Data".		
4.2.1.3	Wim Diepstraten	E	Below figure 4-6: Ack can also be following a Control (Poll) frame.		
4.2.1.3	Greg Smith	E/T	ACK frame should contain SA information (or MPDU_ID) see 5.8.2.2		To ensure the ACK is from the correct station
4.2.1.3	Fischer, Mike.	T	The addressing would be easier to understand if the address was designated RA, which is always a unicast address of a station on the WM, which is not necessarily a property of DA. Also, the text should state ÒThe receiver address of the ACK frame shall be copied from the Address 2 field of the immediately previous directed Data frame or Management frame.		precision

4.2.1.3	Jon Rosdahl	T	The frame format for the ACK frame is shown in figure 4-6. Figure4-6: ACK Frame (Text view of the graphic) FrameControl (2 octets) Duration (6 octets) DA (6 octets) SA (6 octets) CRC (4 octets) The DA of the ACK frame shall be the address contained in the SA field of the immediately previous Data or Management frame.		The Source address was not included. The source address is required to be present in all frames to perform complete independant Network Management.
4.2.1.3	Rick White	T	Must define the Frame Control field on a bit-by-bit basis for an ACK frame.		Makes Standard much clearer. Better chance of interoperability.
4.2.1.3	Rick White	T	Must define how the Duration field is calculated.		
4.2.1.3, 4.2.1.2 and 8.1.2	D. Johnson	T	Document 11-94 / 259a has acceptable wording.	The MAC, to be universal, should have a mechanism for implementing transmitter power control even if the presently specified PHYs cannot implement it. Preliminary studies show that at least 2:1 throughput density per Hertz of bandwidth can be achieved with power control. The scarcity of spectrum dictates that a method must be available to achieve this added throughput capability as technology advances. This is one of the reasons for the no vote.	
4.2.1.3.	Fischerma:ACK Frame Format	T	field DA should be changed to RA		While it is true that for unforwarded traffic, RA=DA, SA=TA, the equalities are NOT true for frames that must be forwarded. Therefore, for control frames, RA and TA are better name choices for the fields.
4.2.1.4	CHRIS ZEGELIN		ADD SID FIELD TO PICTURE		THE PICTURE DOES NOT SHOW THE LOCATION OF THE SID FIELD
4.2.1.4	Sarosh Vesuna		The Duration field is irrelevant for a Poll frame and must be removed from the POLL.		The PSP station responding to a TIM does not know the length of the data frame and thus cannot place a value in the duration field.
4.2.1.4	Sarosh Vesuna		The SID field must be added to the POLL frame. This field goes between the SA & the CRC.		Missing field. Already voted in. Editorial error.
4.2.1.4	A. Bolea	E			Figure 4-7 is missing the SID field.
4.2.1.4	Glen Sherwood	E	Clarify what is meant by the SID field. Is it the SA field?		Text refers to an SID field. Diagram does not show it, but shows an SA field. Prior text refers to SA field as well.
4.2.1.4	Mark Demange	e	Paragraph 2 makes reference to the SID a field which is not present in the frame.		
4.2.1.4	Miceli	E	The Poll Frame in Figure 4.7 does not contain the field SID which is referenced below it.		confusing
4.2.1.4	Rick White	E	Figure 4-7 should indicate the length, in octets, of each field		
4.2.1.4	Rick White	E	BSS Identifier shall be the address of the STA contained in the AP.		The AP could have another MAC address for the DS. The address must be that of the 802.11 MAC.
4.2.1.4	Rick White	E	Figure 4-7 MAC Header includes SA.		

4.2.1.4	Tim Phipps	E	*Replace "Duration" with "SID".* **Figure 4-7: Poll Frame**	The diagram must include a SID, since the text in this section refers to a SID. The diagram should not include a duration field since it is not useful in a poll as in the case where there is a Poll-Data-Ack exchange the polling station does not know the duration of the data MPDU.
4.2.1.4	Wim Diepstraten	E	Figure 4-7 does not show the SID field.	The SID field is part of the Poll frame.
4.2.1.4	C. Thomas Baumgartner	t	Change SA to "DA (SID)" in Figure 4-7 Change following paragraph to "The BSS Identifier, the address of the AP, is the source address. The DA is the SID asssigned by the AP in the Associate Response frame."	The source address is the BSSID of the AP. There is no destination address in the frame. Need to tie the DA into the SID.
4.2.1.4	C. Thomas Baumgartner	t	Where is CF-Poll bit?	I can't find mention of CF-Poll bit referred to in 5.3.3.1
4.2.1.4	Fischer, Mike.	T	Suggest name change to ÒPowerSave PollÓ The addressing would be eaiser to understand if the address was designated TA. The text calls for an SID field which does not appear in figure 4Ð7.	correctness, consistency
4.2.1.4	Joe Kubler	T	in fig 4-7, duration is station id.	The text implies this.
4.2.1.4	Renfro	T	Add SID back into Poll Frame Format.	This would be useful if APs are to respond to a Poll by transmitting Data after an SIFS interval.
4.2.1.4	Rick White	T	Must define the Frame Control field on a bit-by-bit basis for a Poll frame.	Makes Standard much clearer. Better chance of interoperability.
4.2.1.4	Rick White	T	There is no SID shown in Figure 4-7. Should the text be deleted or a SID field be added in Figure 4-7?. If the field is added, it must be part of the Frame Body.	
4.2.1.4	Tom T.	T	Change this section to section 4.2.1.5. Make 4.2.1.4 the description of the CF-END frame.	CF-END description missing.
4.2.1.4	Jon Rosdahl	T/E	The frame format for the Poll frame is shown in Figure 4-7. Figure 4-7: Poll Frame (Text view of the graphic) FrameControl (2 octets) Duration (6 octets) BSS ID (6 octets) SA (6 octets) SID (2 octets) CRC (4 octets) The BSS Identifier (BSS ID) shall be the address of the AP. The SA shall be the address of the station transmitting the frame. The Station Identifier (SID) shall be the value assigned by the AP in the associate response frame.	The SID field was left out of the figure.
4.2.1.4.	Fischerma:PO LL Frame Format	T	field SA should be changed to TA	While it is true that for unforwarded traffic, RA=DA, SA=TA, the equalities are NOT true for frames that must be forwarded. Therefore, for control frames, RA and TA are better name choices for the fields.
4.2.1.5	Jeff Rackowitz	E	Add: CF End Frame	
4.2.1.8	Bob O'Hara	T	Eliminate "Elements Present"	Not necessary since the content of all frames is fixed. There is never an ambiguity that some piece of information is present, or not.
4.2.2	Rick White	E	Title of section should be Asynchronous Data frames	To be consistent with frame formats defined.

4.2.2.1	Bob O'Hara	E	replace "sequence number" and "fragment number" blocks with "Sequence Control"	Figure is in error.
4.2.2.1	C. Heide	E	remove the word "a" from the sentence: "a) If the station is an AP or is a associated ..."	not a sentence
4.2.2.1	Geiger	E	Why doesn't figure 4-1 and figure 4-8 look the same?	They should
4.2.2.1	Glen Sherwood	E	Change "Sequence Number" to "Sequence Control" in Figure 4-8, for consistency. Remove "Fragment Number" from same diagram. Same for Figure 4-9. Keep the DA field the same in all cases. Using address 1 to perform receive decisions doesn't buy much efficiency and is confusing.	Consistency and correctness. The fragment number and sequence number are included in one sixteen-bit value called "Sequence Control".
4.2.2.1 Fig 4-8	Jeff Rackowitz	E	Combine Sequence Number and Fragment Number into one box and call it Sequence Control.	
4.2.2.1	Renfro	E	Update figure 4-8 to reflect changes shown in figure 4-1.	
4.2.2.1	Rick White	E	Figure 4-8 should indicate the length, in octets, of each field.	
4.2.2.1	Rick White	E	The RA shall be the address of the STA contained in the AP.	The AP could have another MAC address for the DS. The address must be that of the 802.11 MAC.
4.2.2.1	Rick White	E	The TA shall be the address of the STA contained in the AP.	The AP could have another MAC address for the DS. The address must be that of the 802.11 MAC.
4.2.2.1	Rick White	E	BSSID a) BSS Identifier shall be the address of the STA contained in the AP.	The AP could have another MAC address for the DS. The address must be that of the 802.11 MAC.
4.2.2.1	Rick White	E	BSSID b) Change "LAN" to "network"	
4.2.2.1	Rick White	E	Change "Data frames" and "Data subtype" to "Asynchronous Data frames" and "Asynchronous Data subtype".	Consistent with section 4.
4.2.2.1	Tim Phipps	E	*Delete* "A station shall use the contents of Address 1 to perform address matching for receive decisions". *Insert* "For point to point transmissions (ToDS=0 and FromDS=0), a station shall use the contents of Address 1 and the BSSID to perform address matching for receive decisions.	The specification did not permit a broadcast to be restricted to a single BSS (but would have made all broadcasts entirely global).
4.2.2.1	Tom T.	E	In Figure 4.8 , 4.9 (and 4.1) change two fields Sequence Number and Fragment Number ot one field called Sequence Control.	Make consistent with field names in section4.1.2.4.
4.2.2.1	Wim Diepstraten	E	It should be clarified when a receiver should use/interpret the BSSID address field. A station (not AP) should verify the BSSID field only to qualify the acceptance of a Broadcast or Multicast frame.	Receivers should explicitly check whether the BSSID matches when receiving a BC/MC frame to block any BC/MC frames from other ESS's, and to prevent duplicate BC/MC frames within the same ESS.
4.2.2.1	A. Bolea	T		It is stated that a Null frame type may be sent by any CF aware station. We should not preclude non-CF stations from transmitting a Null Frame Type. This frame type could be useful for example in notifying other stations of a change in Power Savings Mode.
4.2.2.1	C. Heide	T	Figure 4-8 should have a "Sequence Control" field and no "Sequence Number" or "Fragment Number".	inconstant with section 4.1.2
4.2.2.1	C. Heide	T	Table 4-4 first row (To DS=0 and From DS=0) replace BSSID with N/A	BSSID is not needed

4.2.2.1	C. Thomas Baumgartner	t	to Figure 4-8: DATA Frame add Address 4 field after Address 3, change Sequence Number field to Dialog Token	Table 4-4 shows that Address 4 is used for one condition. Paragraph 4.1.2.4 shows that the two byte field Sequence Control is broken into Dialog Token and Fragment Number fields.
4.2.2.1	Fischer, Mike.	T	Figure 4Ð8 should have sequence number changed to sequence control and fragment number deleted. In the text following Table 4Ð4, replace the first 3 sentences with: ÒA station shall use the contents of the Address 1 field to perform address matching for receive decisions. In cases where the Address 1 field contains a group address, the BSSID must also be validated to ensure that the broadcast or multicast originated in the same BSS.Ó ÒA station shall use the contents of the Address 2 field to direct the acknowledgement if an acknowledgement is necessary.Ó ÒThe DA shall be the destination of the MDSU (or fragment thereof) in the frame body field.Ó ÒThe SA shall be the address of the station initiating the transmission of the MSDU (or fragment thereof) in the frame body field.Ó In the sentence beginning ÒThe Frame BodyÓ add at end Òplus the WEP IV and ICV if WEP=1. The Frame Body is null (length 0) if the Data subtype is not of the form 00xx.Ó In the last paragraph, add at end Òfor CF control purposed, but shall only inspect the fram body if the data subtype is of the form 00xx.Ó Add an additional paragraph: ÒAll stations shall process the Duration field contents of validly formed data frames to update their NAV settings as appropriate under the coordination function rules.Ó	correctness, consistency, clarity, etc.
4.2.2.1	Joe Kubler	T	in fig 4-8, seq number and frag number should be Sequence Control Field	as corrected fig 4-1 and 4-3 illustrate.
4.2.2.1	Jon Rosdahl	T	The frame format for a Data frame is independent of subtype and is shown in figure 4-8. Figure 4-8: DATA Frame (Text view of the graphic) Frame control (2 octets) Duration (6 octets) Address 1 (6 octets) Address 2 (6 octets) Address 3 (6 octets) Sequence Control (2 octets) Address 4 (6 octets) Frame Body (0-2304 octets) CRC (4 octets) The contents of the Address fields of the Data Frame shall be dependent upon the values	Sequence Control Field missing, remvoed Sequence number ar Fragment number fields as they are now sub-fields fo the Sequence control field.
4.2.2.1	Renfro	T	Allow null messages to be sent at any point in superframe.	As currently stated, null messages (subtype 0100) can only be sent during the contention free period of the superframe. These messages may be useful during the contention period as well for such functions as informing other stations of changes in power savings mode.
4.2.2.1	Rick White	T	Must be a subsection for each Asynchronous Data frame type.	Completeness of definition

4.2.2.1	Rick White	T	Each Asynchronous Data frame type should define the Frame Control field on a bit-by-bit basis.	Makes Standard much clearer. Better chance of interoperability.
4.2.2.1	Rick White	T	The DA shall be the address of the device for which the frame is destine.	Does not have to be an 802.11 STA.
4.2.2.1	Rick White	T	The SA shall be the address of the device originating the frame. Does not have to be an 802.11 STA.	Does not have to be an 802.11 STA.
4.2.2.1	Rick White	T	Last paragraph in section does not make sense. Must be clarified.	If a STA can respond to a poll from a PCF, it shall interpret all Asynchronous Data frame subtypes. Otherwise, it should only process Asynchronous Data frame subtype 0.
4.2.2.1.	P. Brenner	E	The SA shall be the address of the station from which the frame was originally initiated	The transmitting station may be the AP.
4.2.2.1.	Fischerma:DATA frame format	T	field names in diagram are not consistent with description of 4.1.2.4., fragment number is a sub-field of sequence control field, diagram shows sequence number and fragment number, diagram should show only sequence control field	Field name usage must be consistent.
4.2.3	Sarosh Vesuna		Figure4-9. The Fragment number seems redundant. Isn't this part of the Sequence control field.	Needs clarification.
4.2.3	Bob O'Hara	E	replace "sequence number" and "fragment number" blocks with "Sequence Control"	Figure is in error.
4.2.3	C. Heide	e	remove the word "a" from the sentence: "a) If the station is an AP or is a associated ..."	not a sentence
4.2.3	C. Heide	e	In point (b) replace "ad hoc LAN" with "independent BSS" twice	that's what it means to say
4.2.3	Fischer, Mike.	E	Figure 4Ð9 should be updated to delete the fragment number field and to change the sequence number field to sequence control.	consistency
4.2.3	Geiger	E	Figure 4-9 is missing octet count for each field	useful
4.2.3	Jeff Rackowitz	E	Where are the element type codes defined and what does "ordered by increasing element type code" mean?	
4.2.3	Mark Demange	e	"is a associated" should be "is associated"	
4.2.3	P. Brenner	E	Add specifications of the Connection Request, Grant Connection, and End Connection frames	All the management frames must be specified
4.2.3	P. Brenner	E	Add the Regularity Domain and the Payload elements to the applicable frames	
4.2.3	Renfro	E	Update figure 4-9 to reflect changes shown in figure 4-1.	
4.2.3	Rick White	E	Figure 4-9 should indicate the length, in octets, of each field.	
4.2.3	Tom T.	E	delete word 'a' in 'is an AP or is a associated...'	
4.2.3	Wim Diepstraten	E	Figure 4-9 has the BSSID and DA fields exchanged. It should be clarified that this section lists the mandatory elements that are required per specific management frame. However the frames can also contain additional elements.	Management frames stay within the same BSS, and are not frowarded by the DS. So they have the To and From DS both 0 in table 4-4. An example of additional elements that do not need to be mandatory is the SuperFrame related elements, that should be included in the Beacon when a PCF is active.
4.2.3	Wim Diepstraten	E	This section does also need to cover the remaining Management frame types. - Connection Request - Grant Connection - End Connection	
4.2.3	A. Bolea	T		The BSS-ID and DA fields in figure 4-9 should be reversed. We always want to perform address filtering on the Address 1 field which should be the DA for Management frames.

4.2.3	A. Bolea	T		There is no reason for having listed parameters(with the exception of TIMs and Broadcast Indicators) as elements. Using elements just adds overhead. I recommend defining fixed fields for each message type, and follow these with optional element areas for TIMS and Broadcast Indicators. If we decide to keep these fields as elements, we should define the timestamp as element #0 so that it always comes out in the same location of every frame making the hardware implementation easier. The Weight field is gone, and the channel sync information should use the correct element names.
4.2.3	C. Heide	T	Figure 4-9 should have a "Sequence Control" field and no "Sequence Number" or "Fragment Number"	inconsistent with section 4.1.2
4.2.3	C. Heide	t	add management frame descriptions for: Connection Request, Grant Connection, and End Connection.	to be consistent with table 4-1
4.2.3	C. Thomas Baumgartner	t	change Sequence Number to Dialog Token in Figure 4-9	Paragraph 4.1.2.4 shows that the two byte field Sequence Control is broken into Dialog Token and Fragment Number fields.
4.2.3	Geiger	T	Where are the element type codes for the elements	Define element type codes
4.2.3	Joe Kubler	T	in fig 4-9 seq number and frag number should be Sequence Control Field	as corrected fig 4-1 and 4-3 illustrate.
4.2.3	Jon Rosdahl	T	The frame format for a Management frame is independent of subtype and is shown in Figure 4-9. Figure 4-9: Managmement Frame (Text view of the graphic) Frame control (2 octets) Duration (6 octets) BSS ID (6 octets) DA (6 octets) SA (6 octets) Sequence Control (2 octets) Frame Body (0-2304 octets) CRC (4 octets) The address fields for the Management frames shall not vary by brame subtype....	For consistency, the DA, SA order was restored, and the Sequence and Fragment Number Fields were removed as they now sub-fields of the added Sequence Control Field.
4.2.3	Lee Hamilton	T	Diagram of each management frame type showing all required and optional fields in the frame bodies.	The content of the frame body of management frames is not very well defined. This would go a long way in correcting this problem.
4.2.3	Renfro	T	Define fixed frame for each management frame type. Add figure for each frame type showing position of fields.	There is far too much flexibility in the definition of frame formats to ensure interoperability with cost effective designs. Only fields which may or may not be present should be considered elements. For example, in a beacon message the time stamp must always be present (∴ should not be an element) but a TIM may or may not be present (∴ should be an element). To allow for implementation in reasonable hardware, the position of critical fields in a frame must be not only strictly defined but also fixed in relation to other fields.
4.2.3	Rick White	T	Must be a subsection for each Management frame type.	Makes Standard much clearer. Better chance of interoperability.

4.2.3	Rick White	T	Each Management frame type should define the Frame Control field on a bit-by-bit basis.	Makes Standard much clearer. Better chance of interoperability.
4.2.3	Rick White	T	The Address fields should be rearranged in the following manner: DA, SA, BSSID.	This allows address matching to be performed the same as with Asynchronous Data frames.
4.2.3	Tim Phipps	T	*Add:* Management frames will never be fragmented.	There will be no advantage from fragmenting a management frame, but this would significantly increase the complexity of management exchanges.
4.2.3 - 4.4	Rick White	T	Sections 4.2.3 & 4.4 should be combined.	The general formats of the Management frames and Elements should be presented followed by each Management frame type with a figure showing all fields present in the frame. A figure should show the Frame Control field on a bit-by-bit basis and a figure showing a bit-by-bit representation of each element present in a particular frame subtype.
4.2.3.	P. Brenner	E	Figure 4-9 must have the addresses fields as Address 1, Address2 and Address 3 instead of BSSID,SA and DA	The same filtering as in Data frames must be used.
4.2.3.	P. Brenner	T	Add: the BSSID on Management frames may be Broadcast.	When the station is sending a Probe request the BSSID is unknown
4.2.3.1	Jim Panian	E	Add BSS-ID and a field that indicates ad-hoc or infrastructure network to the Beacon.	The Beacon needs to contain the BSS-ID. BSS-ID is required for a station to initiate an Association request to an access point. Also, Beacons need to indicate whether the network is ad-hoc or infrastructure. Otherwise, the station will not know whether to associate with an access point or not.
4.2.3.1	Tim Phipps	E	The Frame Body shall comprise the following information: time stamp, beacon interval, DTIM period, DTIM count, channel sync information, ESS ID, TIM and broadcast indicator.	Delete the "Weight" field, since the use of it is not specified by the standard.
4.2.3.1 4.2.3.9	Wim Diepstraten	E	The weigth field is not part of the Beacon and Probe Response.	The weigth field consept is I thought deleted from the standard.
4.2.3.1	Joe Kubler	T	delete weight, channel sync information" should be "Set, Pattern, Index, Hop Timing"	FH needs to know, weight is gone
4.2.3.1	John Hayes	T	TBD	Which time stamp (short or long) is used in the beacon?
4.2.3.1	John Hayes	T	TBD	The weight element is undefined.
4.2.3.1	John Hayes	T	Add paragraph: The channel sync information is comprised of the Set, Pattern and Index elements.	Channel Sync Information is undefined.
4.2.3.1	Renfro	T		Distinguish between beacon frames in Ad Hoc networks and beacon frames in infrastructure networks. Update to reflect current frame contents (e.g., no weight field).
4.2.3.1	Simon Black	T	The BEACON management frame body shall consist of the following elements: Short Time Stamp, Long Time Stamp, Beacon Interval, DTIM period, DTIM count, ESS ID, TIM and Broadcast Indicator, Hop Parameters.	The 'Weight' element is no longer required and has been deleted from the standard. The 'Channel Sync Information' Element is undefined in the standard. Add Hop Parameters (for an FH PHY)
4.2.3.1 to 4.2.3.12	Jeff Rackowitz	E	The formats of these frames need to be defined.	
4.2.3.10	Bob O'Hara	E	capitalize "body".	consistency
4.2.3.11	Bob O'Hara	E	capitalize "body".	consistency
4.2.3.11.	Sarosh Vesuna			A reference to the algorithm list is needed. Unknown at this time.
4.2.3.12	John Hayes	T	TBD	The Identity Assertion element is undefined.

4.2.3.13	Tom T.	T	Connection Request, Grant Connection, and End Connection sections need to be added to define these frames.	
4.2.3.13 to 4.2.3.15	Jeff Rackowitz	E	Add Connection Request Frame Format, Grant Connection Frame Format, and End Connection Frame Format. These exist in Section 5.3.6 but belong here.	
4.2.3.3	Bob O'Hara	E	replace "is" with "shall"	Proper standard language
4.2.3.3	P. Brenner	T	Add a new element for specifying the "reason" for disassociation.	Disassociation can be invoked for a variety of reasons (bad WLAN connection, station removed for maintenance etc.). Specifying and registering the reasons for disassociation will help in the ongoing network management.
4.2.3.4	C. Heide	t	Association request must also contain a CF-awareness indicator.	to be consistent with section 5.3.5.2
4.2.3.4	C. Heide	t	Association request must also contain something to facilitate negotiation of maximum age of AP buffer data.	to be consistent with section 7.2.1.5
4.2.3.4	Joe Kubler	T	a "sequence element" should be included.	other protocols that have association/reassociation functions (such as the proposed mobile IP) include such a field.
4.2.3.4 till 4.2.3.7	Wim Diepstraten	T	The same elements as discussed under section 2.7.2 and 2.7.3 should be added here aswell.	
4.2.3.5	C. Heide	t	Association Response must contain something to facilitate negotiation of maximum age of AP buffered data.	to be consistent with section 7.2.1.5
4.2.3.5	C. Heide	t	remove status from the Association Response frame.	If an association request fails, send a disassociation frame, then there is no need for this field.
4.2.3.5	C. Heide	t	Reassociation Request must have a CF-awareness indication.	to be consistent with section 5.3.2.5
4.2.3.6	A. Bolea	T		Can be incorporated into Association Message.
4.2.3.6	Joe Kubler	T	a "sequence element" should be included.	other protocols that have association/reassociation functions (such as the proposed mobile IP) include such a field.
4.2.3.7	Sarosh Vesuna		Change text as follows. " The Frame Body shall consist of a status value, an error indication and **a new** Station ID (SID) assigned.	Clarifies that the Reassociation provides a new SID.
4.2.3.7	A. Bolea	T		Can be incorporated into Association Response Message.
4.2.3.8	Tom T.	T	The Frame Body shall consist of the supported rates and ESS ID.	
4.2.3.9	Tim Phipps	E	The Frame Body shall consist of time stamp, beacon interval, DTIM period, DTIM count, channel sync information, supported rates and ESS ID.	Delete the "Weight" field, since the use of it is not specified by the standard.
4.2.3.9	A. Bolea	T		Weight element is gone. Channel sync information element should be replaced with correct names.
4.2.3.9	Joe Kubler	T	delete weight, channel sync information" should be "Set, Pattern, Index, Hop Timing"	FH needs to know, weight is gone
4.2.3.9	John Hayes	T	TBD	Which time stamp (short or long) is used in the beacon?
4.2.3.9	John Hayes	T	TBD	The weight element is undefined.
4.2.3.9	John Hayes	T	Add paragraph: The channel sync information is comprised of the Set, Pattern and Index elements.	Channel Sync Information is undefined.
4.2.3.9	Renfro	T		Distinguish between probe/probe response frames in Ad Hoc networks and probe/probe response frames in infrastructure networks. Update to reflect current frame contents (e.g., no weight field).

4.2.3.9	Simon Black	T	The Probe Response management frame body shall consist of the following elements: Short Time Stamp, Long Time Stamp, Beacon Interval, DTIM Period, DTIM Count, ESS ID, and Supported Rates, Hop Parameters.	The 'Weight' element is no longer required and has been deleted from the standard. The 'Channel Sync Information' Element is undefined in the standard. Add Hop Parameters (for an FH PHY)
4.2.3.9	Tom T.	T	Change 'Timestamp' to 'Short Time Stamp'.	There is no element defined that is simply 'Timestamp'.
4.2.3.x, 4.3, 4.4.x	Fischer, Mike.	T	Update with detailed frame contents and element definitions as shown in the appropriate sections of document 95/17	completenes, clarity
4.3	A. Bolea	E		Clarify what Request and Response Frames are.
4.3	C. Heide	e	rewrite frame exchanges to use correct frame type and subtype names.	to be consistent with table 4-1
4.3	Jim Panian	E	Add "DATA-DATA (fragmented broadcast MSDU)" to the list	The "DATA-DATA (fragmented broadcast MSDU)" is missing from the list.
4.3	Mahany	E	Change to: "The following frame sequences are permitted."	Readability
4.3	Tim Phipps	E	The following frame sequences are possible: a) DATA **b) DATA - DATA (fragmented MSDU)** c) DATA - ACK d) RTS - CTS - DATA - ACK e) DATA - ACK - DATA - ACK (fragmented MSDU) f) RTS - CTS - DATA - ACK - DATA - ACK (fragmented MSDU) g) POLL - DATA - ACK h) POLL - DATA - ACK - DATA - ACK (fragmented MSDU) i) POLL - ACK (no data) j) ATIM - ACK **k) ATIM** l) REQUEST - ACK m) RESPONSE - ACK	Broadcast MSDUs may be fragmented into multiple MPDUs. An ATIM may be sent to a group address, in which case it will not be acknowledged.
4.3	John Hayes	E/T	l) DATA - DATA - DATA (fragmented broadcast/multicast MSDU)	Broadcast and multicast frames may be fragmented.
4.3	Wim Diepstraten	E/T	Clarify that items j and k are Management Request and Responses. Add Null-Ack.	The Null-Ack frame exchange is usefull to dynamically switch from the TAM mode to one of the power save modes PSNP and PSP. It is important that this frame is also Acked, to prevent that a lost Null frame results in an AP that is not aware that a station is sleeping.
4.3	Bob O'Hara	T	replace "possible" with "allowed"	limit allowable frame sequences
4.3	Bob O'Hara	T	make the frame types in the list consistent with table 4-1	obsolete frame types are referenced
4.3	Bob O'Hara	T	delete CF-END from table 4-1	See comment for 5.3.1 on Superframe

4.3	C. Heide	t	add exchanges: l) Management:Beacon m) Control:CF_End n) Management:Grant Connection - Control:ACK o) Management:End Connection - Control:ACK p) Management:Disassciation - Control:ACK q) Management:Authentication - Control:ACK	missing frame exchange sequences
4.3	C. Thomas Baumgartner	t	Add the other frame sequences possible	This list should either be marked as not comprehensive or should include all possible sequences. I'm not an expert in this MAC but is this really all of the list?
4.3	Greg Ennis	T	Add the following: "The frames within each of these sequences are separate by a SIFS interval.	Must say what we mean hear by a "frame exchange sequence", namely that these frames are separated by SIFS.
4.3	Renfro	T	Allow for Poll - Ack with data present	The most significant power savings can be achieved if long periods of sleep are possible (PSP mode). As these periods grow longer, it becomes impractical for an AP to store all data destined for a particular station where it can be available for transmission within an SIFS time. By allowing the station to poll the AP and then remain awake while the data is downloaded to the AP from another source, much longer sleep times are possible with only a slight increase in awake time.
4.3	Rick White	T	This is not an inclusive list of ALL the frame exchange sequences. It does not cover CF frame exchanges or Management frame exchanges. The section should be modified to show all possible frame sequences or be deleted.	
4.3	Tom T.	T	Add frame exchange l) DATA-DATA (PCF CF-Burst)	This exchange can occur during a Contention Free period
4.3.	P. Brenner	E	Paragraphs j and k, should be MANAGEMENT - ACK	There is no REQUEST/RESPONSE frame type.
4.4	CHRIS ZEGELIN		NOW THAT SOMEONE CHANGED THE DEFINITION OF THE LINK TO BE IN TWO BYTE INCREMENTS, THERE ARE LOTS OF ELEMENTS THAT CONTAIN A SINGLE BYTE THAT NEED REDEFINING TO INCLUDE A PAD BYTE.	
4.4	CHRIS ZEGELIN		THE SECTION THAT GIVES THE ACTUAL ELEMENT TYPE VALUE IS NOW GONE. LETS PUT IT BACK.	
4.4	C. Thomas Baumgartner	e	Change first sentence to "Elements are defined to have a common general format consisting of a one-octet Code field, a one-octet LInk field and a variable-length element-specific field. Within the Code field there is a 1-bit More indicator (...), and a 7-bit Element Type field."	Correct the description to match Figure 4-10: Element Format.
4.4	C. Thomas Baumgartner	e	All the sub-sections in this section start with "This field...". This is incorrect. Change to "This element..." and then edit the sentence as necessary.	These are elements not fields. This really shows up in 4.4.10 when there is no element-specific field in the element but the first sentence says this field is a boolean indicator.
4.4	Jeff Rackowitz	E	... Code field: a 1 bit More indicator ... a 7-bit element type; a one octet link field; and a veriable-length ...	
4.4 Fig 4-10	Jeff Rackowitz	E	Link defines the Octets Specific to elements as 2-octet groups. sections 4.4.1 through 4.4.28 should describe 2-octet element-specific field length as the mimimum size.	
4.4	Mark Demange	e	Pictures of each element defining all fields should be provided.	

4.4	Okada	E Approve	Element type is not defined .. a 1 bit More indicator (identifying whether additional elements are present), a 7 bit Element Type, one Octet Link field, and a variable-length element-specific field.	
4.4	A. Bolea	T		Define element type codes.
4.4	A. Bolea	T		Since the link field counts number of 2-octet groups, should the elements which currently require one octet for the element specific fields(ex: Beacon Interval), be defined to be two octets long. This makes their range wider, more flexible, without incurring any overhead. If we don't add this change, we should specify that unused octets are always zero.
4.4	bdobyns	T	Need a table of Element-type (numeric value) to element type (text) mapping.	I could just assume the heading sub-numbers are the type numbers instead.
4.4	Bob O'Hara	T	eliminate the element coding mechanism and replace with a simple length + content format for variable length information items only.	Frame content and order are fixed. The current element encoding mechanism is overly complex for the needs of this standard.
4.4	C. Heide	t	either: (1) remove "even, " from Figure 4-10 "(even, 0 to 510)"; or (2) add a pad byte to all one byte elements; and a 'true length' field within elements of variable length.	choose option (1) because there is no good reason why elements should be an even number of octets. Given the contents supplied in the following sections there would be a lot of useless pad bytes added.
4.4	C. Thomas Baumgartner	t	must have the element type numbers defined somewhere in this section	Protocol can't be implemented without Element Type values
4.4	C. Thomas Baumgartner	t	Change Figure 4-10: Element Format to "Link: 8-bit number of subsequent octets (0-255)"	There is only one element type that requires lots of octets-TIM. If we only allow for 255 octets in the element specific octets there is plenty of room for all the SID's ever needed. This element has a 2 octet overhead so room for SID's is INTEGER(253/8)*56=1736
4.4	Joe Kubler	T	define element type values. could just use section number as value. a table would be better	all stations must use same values
4.4	Joe Kubler	T	add section defining sequence type for use with association and reassociation. 4.4.X Association Sequence This field is used to sequence/identify association/reassociation requests. The element specific field length is 2 octets.	other association protocols (such as the proposed mobile IP) utilize such functions to assist the DS (or similar infrastructure).
4.4	Lee Hamilton	T	Define the element type for all defined elements.	It is impossible to create elements if the element types are not defined.
4.4	Mark Demange	t	Need to define value and position of spare bits in elements.	
4.4	Mark Demange	t	Need to define position of spare octet for elements where only 1 octet is required. Elements must have an even number of octets requiring definition of which of the two octets contains spares.	Lack of definition will cause incompatibilities between different vendors interpretation of the spec.
4.4	Mark Demange	t	Eliminate requirement for even number of element specific octets.	This requirement adds significant overhead to the element process.

4.4	Mark Demange	t	Eliminate all defined elements and use specific frame formats. May keep elements concept for future.	If the use of all defined elements is understood then all fields in elements should be placed in fixed frames thereby reducing overhead. Examples: Beacon interval requires 4 bytes for 1 byte of information, DTIM count 4 bytes for 1 byte of information, DTIM period 4 for 1 byte, Broadcast indicator 2 bytes for 1 bit, SID 4 bytes for 2 bytes, Short time stamp 6 bytes for 4 bytes, long time stamp 10 bytes for 6 bytes, Request/response indicator 4 bytes for 1 bit, privacy algorithm number 4 bytes for 2 bytes, status value 4 bytes for 1 bit,current AP address 8 bytes for 6 bytes, transaction sequence 3 bytes for 1 byte, authentication algorithm number 4 bytes for 2 bytes. Many of the above mentioned elements will be used quite often making the overhead unacceptable.
4.4	Mark Demange	t	Need to define element type field for all defined elements. Example: what is the type field setting for the Beacon Interval element.	Undefined values for necessary field is inappropriate for a standard.
4.4	Miceli	T	element codes are not defined	needed for interoperability
4.4	Renfro	T	Reduce number of parameters considered to be elements. Reserve elements for parameters only present part of the time and for future modifications.	Most fields now considered as elements are always in a particular frame type and should be considered as fixed fields in fixed locations. Currently, the only field which should be an element is the TIM.
4.4	Renfro	T	Element codes must be defined.	
4.4	Rick White	T	Elements should be replaced with fixed fields.	Elements are a complete waste of bits. There is not reason that the Fields can't be predefined to reduce the size of the Frame Body of Management frames. In some cases it takes 4 octets to transfer 1 octet of information. This is a 400% overhead. In other cases it takes 2 octets to transfer a single bit of information. This is a 1600% overhead. The element type can be eliminated due to the fact that the type of the field is known by its position in the frame. Variable length fields could have a length octet as the first octet in the field. I will continue to vote NO on letter ballots for the draft a long as "elements" are present in the frame body.
4.4	Rick White	T	There must be a figure for each field in the Frame Body showing the definition of the bits.	Clarifies the Standard
4.4	**Siep**	**T**	**Frame Body Element Content Definitions[Do not use element structure]** --OR-- Link: 8-bit number which is the offset to beginning of next element from the beginning of this element.~~of subsequent 2-octet groups (0-255 for 0-510 octets)~~	**I prefer a strict offset-from-the-beginning definition for all control fields: the element structure makes assumptions on how much compute power is available to parse information. If elements are retained, the link field needs to explicitly indicate how large this element is. The problem case is where a new element type is introduced (revision of 802.11) and it happens to be put at the beginning of the list. Older 802.11-compliant devices will not know how large the new element is and will not be able to parse anything.**

4.4	Simon Black	T	Each element is assigned a unique code as defined in table 4-x below. Element Types shall be coded in natural binary. **Element** — **Element Type** Short Time Stamp — 0 Long Time Stamp — 1 Beacon Interval — 2 DTIM Count — 3 DTIM Period — 4 Broadcast Indicator — 5 Station ID — 6 TIM — 7 ESS ID — 8 Request/Response Indicator — 9 Privacy Algorithm Number — 10 Status Value — 11 Error Indicator — 12 Current AP Address — 13 Transaction Sequence — 14 Supported Algorithm List — 15 Authentication Algorithm List — 16 Identity Challenge — 17 Challenge Response — 18 Challenge Result — 19 Regulatory Domain — 20 Hop Set 21 Hop Pattern — 22 Hop Index — 23 Hop Timing — 24 Supported Rates — 26 Payload 27 Connection ID — 28	Element types must be defined within the standard. Time stamp information must appear in a fixed position to allow easy insertion during transmission. The simplest way to achieve this is to place the Short Time Stamp element at the top of the list (with the lowest element type code). This will then be the first element transmitted according to the rules in 4.2.3.
4.4	Simon Black	T	Link: Number of information octets specific to element. The element structure shall always be an even number of octets. If the element information is an odd number of octets a single octet pad field shall be added. This value of this pad field shall be 00000000b. (The diagram may have to be modified to illustrate a pad field).	The Link field in the element format is currently defined as an '8 bit number of subsequent two octet groups'. This does not work out for variable length information elements. Better to set the link field to the number of octets in the element information field. Specify that elements are always an even number of octets (pad the information field to an even number of octets if required). This will ensure word alignment which seems to be the intent.

<table>
<tr>
<td>4.4</td>
<td>Tim Phipps</td>
<td>T</td>
<td>Add the following table, or distribute the values amongst sections 4.4.1 - 4.4.27:
<table>
<tr><th>Element</th><th>Element Type</th></tr>
<tr><td>Short Timestamp</td><td>1</td></tr>
<tr><td>Long Timestamp</td><td>2</td></tr>
<tr><td>Beacon Interval</td><td>3</td></tr>
<tr><td>DTIM Count</td><td>4</td></tr>
<tr><td>DTIM Period</td><td>5</td></tr>
<tr><td>Broadcast Indicator</td><td>6</td></tr>
<tr><td>Station ID</td><td>7</td></tr>
<tr><td>TIM</td><td>8</td></tr>
<tr><td>ESS ID</td><td>9</td></tr>
<tr><td>Request/Response Indicator</td><td>10</td></tr>
<tr><td>Privacy Algorithm Number</td><td>11</td></tr>
<tr><td>Status Value</td><td>12</td></tr>
<tr><td>Error Indicator</td><td>13</td></tr>
<tr><td>Current AP Address</td><td>14</td></tr>
<tr><td>Transaction Sequence</td><td>15</td></tr>
<tr><td>Supported Algorithm List</td><td>16</td></tr>
<tr><td>Authentication Algorithm Lis</td><td>17</td></tr>
<tr><td>Identity Challenge</td><td>18</td></tr>
<tr><td>Challenge Response</td><td>19</td></tr>
<tr><td>Challenge Result</td><td>20</td></tr>
<tr><td>Regulatory Domain</td><td>21</td></tr>
<tr><td>Hop Set</td><td>22</td></tr>
<tr><td>Hop Pattern</td><td>23</td></tr>
<tr><td>Hop Index</td><td>24</td></tr>
<tr><td>Hop Timing</td><td>25</td></tr>
<tr><td>Supported Rates</td><td>26</td></tr>
<tr><td>Payload</td><td>27</td></tr>
<tr><td>Connection ID</td><td>28</td></tr>
</table>
</td>
<td>The encodings of elements must be defined.

The short and long timestamps have been moved to the start of the list. This is to allow implementations to insert the (varying) timestamp element body in hardware and format subsequent (fixed or slowly-varying) elements in software.</td>
</tr>
<tr>
<td>4.4</td>
<td>Tim Phipps</td>
<td>T</td>
<td>Replace: "Link: 8-bit number of subsequent 2-octet groups"

With: "Link: 8-bit number of subsequent octets. The starting position of any following element is calculated after rounding this number up to an even number of octets".</td>
<td>It is not sufficient to record only the number of 2-octet groups, because elements that have a variable number of octets (e.g. ESS-ID) cannot be represented unambiguously.

Rounding up the link field ensures that elements are always 2-octet aligned, which was the intention of the original modifications in D1.</td>
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4.4	Tom T.	T	Table of unique element codes is missing. Assign elements numbers (any number will do; just go down the list and sequentially number them) and add a table to 4.4 summarizing the element names and code. (adding the length to this table wouldn't hurt as an easy reference source for the implementer) Length conflict of Element Type and Link fields. Naming confilict between Code field and Element Type. Make the MSB of the Link field into an extension bit E. E = 0 => number of octets specific to element is equal to the value in the Link octet. E = 1 => number of octets specific to element is equal to the value in the word formed by the Link field and the next octet. The Link field is the MSB and the E bit is ignored in the Length calculation. Add element to indicate that the associating STA can transmit during the CF period. This would be a one octet field that takes on true or false values.	Second last sentence specifically says that the codes are defined in the specification. There are two conflicting descriptions of an element in this definition. One in the first paragraph and one in Figure 4.10. I'm not sure which is correct (i.e. which got voted on during a full working group session). In many subsections there is the statement 'The element-specific field length is one octet. The Link field represents 2-octet groups implying that the length must be even with one octet always null. Since most elements are less than 128 octets it seems that the link field should be the exact length of the element and include an extension bit. Section 5.3.5.2 says this information is needed when a STA Associates with an AP.
4.4	Okada	T Approve	In case of one octet element-length, which octet is available? Element consists of even octets basically	
4.4, et seq	Bob O'Hara	T	Values and formats are unspecified for the defined information elements	specification is required
4.4.1	Bob O'Hara	E	replace "Beacon generations" with "the generation of Beacon frames".	Better usage, clarity.
4.4.1	Renfro	E		Representation of beacon interval in msec is not consistent with later definition (usec).
4.4.1	C. Thomas Baumgartner	t	Change beacon interval field length to 2 octets. Define first octet as all 0 if desired or change units to 100's or 10's of microseconds and use both octets. OR change Figure 4-10	Can't have 1 octet fields according to 4.4. Since the capacity is available to become less granular at no extra cost it should be used; at higher speeds in future might want to specify the timing more accurately.
4.4.1	Renfro	T	Define beacon interval in terms of number of hops (or number of base intervals for non-FH PHYs) not milliseconds.	This simplifies the hardware implementation without significantly impacting flexibility. It allows a single base counter (e.g., hop counter) to drive another counter with smaller maximum range for beacon intervals, wakeup intervals, etc. With the 25 ppm accuracy of 802.11 clocks, having beacons occur more often than once every 500 msec or so is wasteful of bandwidth. With a maximum hop dwell time of 400 msec, it is practical to limit the occurrence of beacons to once every N hops. This also allows hop and beacon strobes to be aligned. This is an advantage when determining when a station must start to wakeup in order to receive a beacon. I would also argue that the beacon should then be delayed relative to the hop strobe by a fixed amount to allow for wakeup on a hop strobe. This fixed amount would be the time required for the station to go from doze to full receive mode (probably about 4 msec).
4.4.1	Tim Phipps	T	*Replace:* "milliseconds" *with* "microseconds".	This makes it consistent with the units in which TSF time, Hop dwell time are represented in frame formats. It also makes it consistent with the proposed units in which the beacon interval is represented in the MIB.