Project: IEEE 802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [P802.15.3a, Report on the unresolved no comments for the MERGED PROPOSAL #1.]

Date Submitted: [10May04]

Source: [Allen Heberling] Company [Freescale Semiconductor, Inc]
Address [8133 Leesburg Pike Vienna, VA USA]
Voice:[+1 703 269 3000], E-Mail:[aheberling@xtremespectrum.com]
Source: [Ian Gifford] Company [Freescale Semiconductor, Inc.]
Address [23 Kelshill Road Chelmsford, MA 01863 USA.]
Voice:[+1 978 815 8182] E-Mail:[giffordi@ieee.org]

Re: [-03/041r7, etc.]

Abstract: [P802.15.3a, Report on the unresolved no comments for the MERGED PROPOSAL #1.]

Purpose: [The purpose of this submission is to provide the group a compilation of the unresolved no comments lodged against the MERGED PROPOSAL #1 or MB-OFDM Proposal confirmation.]

IEEE 802.15 Working Group for Wireless Personal Area Networks (WPANs)

Report on the unresolved no comments for the MERGED PROPOSAL #1

Contents

- Overview
- No comment summary by topics
- Appendix – No comment detail by topics
  - Mar04
  - Nov03
  - Jul03

Overview

- The MERGED PROPOSAL #1 has received ~531 no comments during three (3) confirmation attempts i.e., Jul03, Nov03, and Mar04
- The proposal authors have not resolved these no comments to the satisfaction of the minority, most of the no comments have been repeatedly submitted but no resolution has occurred
- The no comments will continue to be submitted but it is becoming clear that they are either misunderstood or are being ignored by the proposal authors
- Suggestion to the Majority to review and approve the proposal author's optional response prior to the next confirmation vote and try to focus on resolution and interactive discussion for ALL the no comments proffered

If the remaining proposal fails to achieve a 75% majority, the members who voted "no" shall be requested to state why they voted no and what would be required to change their vote to an affirmative vote. **The proposer shall have an opportunity to respond to the concerns of the no voters**, after which a roll call vote will be taken to approve the proposal." -03/041r7

No comment summary by topics

NO	TOPIC	DESCRIPTION	Mar-04	Nov-03	Jul-03	COMMENT STATUS	RESPONSE STATUS
1	FCC	self explanatory	38	46	54	UNRESOLVED	UNSATISFIED
2	CSM	Common Signaling Mode	30	0	0	UNRESOLVED	UNSATISFIED
3	HBRP	High bit Rate Performance	16	3	5	UNRESOLVED	UNSATISFIED
4	Interference	self explanatory	16	11	3	UNRESOLVED	UNSATISFIED
5	Cmplx	Complexity	13	7	8	UNRESOLVED	UNSATISFIED
6	Tones	self explanatory	12	8	6	UNRESOLVED	UNSATISFIED
7	TTM	Time to Market	9	3	45	UNRESOLVED	UNSATISFIED
8	DualPth	Adopt both XSI and TI proposals	6	2	5	UNRESOLVED	UNSATISFIED
9	SOP	Simultaneous Operating Piconets	6	19	17	UNRESOLVED	UNSATISFIED
10	Demo	self explanatory	3	4	4	UNRESOLVED	UNSATISFIED
11	LOC	Location & Ranging	3	4	25	RESOLVED	SATISFIED
12	Notches	self explanatory	3	0	2	UNRESOLVED	UNSATISFIED
13	Pwr	Power	2	3	5	UNRESOLVED	UNSATISFIED
14	Coexist	self explanatory	1	4	0	UNRESOLVED	UNSATISFIED
15	MAC	self explanatory	1	8	6	UNRESOLVED	UNSATISFIED
16	PAR	self explanatory	1	1	0	UNRESOLVED	UNSATISFIED
17	ACQ	Acquisition	0	0	2	RESOLVED	SATISFIED
18	Assoc	Association	0	1	1	UNRESOLVED	UNSATISFIED
19	AWOV	Agree with other Voters	0	6	5	UNRESOLVED	UNSATISFIED
20	Bands	self explanatory	0	1	2	UNRESOLVED	UNSATISFIED
21	CCA	self explanatory	0	0	8	RESOLVED	SATISFIED
22	CEReq	CE Requirements	0	1	1	UNRESOLVED	UNSATISFIED
23	Characterization	self explanatory (TomS)	0	8	0	UNRESOLVED	UNSATISFIED
24	IP	Intellectual Property Rights	0	13	2	UNRESOLVED	UNSATISFIED
25	Merger	STMicro and TI/Intel	0	0	6	RESOLVED	SATISFIED
26	RFA	RF analysis	0	1	3	UNRESOLVED	UNSATISFIED
27	Undecided	self explanatory	0	0	2	UNRESOLVED	UNSATISFIED
			160	154	217		

Appendix - No comment detail by topics

Mar04 -04/0109r5 & -04/0167r2

Nov03 -03/0441r4

Jul03 -03/0238r4

Cl **00** *SC* **0** *P* **0** *L* **0** # **11**

Chang, Soo-Young University of California,

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

complexity - By using OFDM, the complexity increases. This parameter of complexity is important for low cost, low power consumption requirements.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **18**

Dydyk, Michael Consultant

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

Did not like the display of arrogance by Proposal #1 Team by refusing to engage in compromise discussions.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **22**

Emami, Shariar Motorola, Inc.

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

The complexity associated with MBOA as it stands is twice that of DS-UWB.

SuggestedRemedy

I would consider doing so if they make their complexity comparable or lower than that of DS-UWB.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **35**

Gifford, Ian Consultant

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

MBOA is a great proposal in a lot of dimensions. However, the complexity of the MBOA proposal is not scalable. As stated above, I feel that the predominant application for UWB will be cable replacement. For low cost, short range, battery-powered apps, a lower complexity waveform might be much better suited. Unfortunately, the basic transceiver and baseband processor capabilities required to support OFDM make it difficult to envision a " low complexity" version of MBOA for cable replacement apps.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **50**

Herold, Barry Motorola, Inc.

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

The implementation complexity based on OFDM, to my understanding, must be higher than that of XSI's. It can never be any simpler, any cheaper, less power-consuming than the XSI's mechanism. FCC regulations. At this time, it is not clear that the OFDM solution can be implemented under FCC rules because of frequency hopping rules currently in effect.

SuggestedRemedy

I will change my NO vote to YES if the implementation cost and power consumption can beat that of XSI's. Also, reasonable assurances must be offered that the OFDM approach, as presented, meets FCC guidelines.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **151**

Mc Laughlin, Michael decaWave LLC

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

The new band grouping scheme results in many piconet options which have very high attenuation.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **70**

McCorkle, John — Motorola, Inc.

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

The complexity of the MB-OFDM is reduced to less than 250k gates, or effectively the equivalent of the DS-UWB proposal, or if modes are included that allow a compliant radio to be built with the lower complexity/power/die-size equivalent of the DS-UWB proposal. I do not believe there is any good reason to require 3-times more gates, yet no better performance.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **154**

Naeve, Marco — Eaton Corporation

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

From what has been show so far the MBOA solution seems to be more complex than the DSUWB solution and also does not seem to be capable of growing beyond the 500Mbps limit. As we have seen in the recent past, the need for higher and higher data rates is increasing in a rapid pace and we need to select a technology that is open to future expansion well beyond 1Gbps.

SuggestedRemedy

I will consider changing my no vote to yes if the MBOA group can show a data rate growth path for future expansions in this area.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **102**

Rypinski, Chandos — Individual

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

There is no sufficient reason to use frequency hopping. To use hopping to reduce average power density is not within my understanding of the rules for this band. In a system consisting of multiple contiguous access points, this mode will create increased interference unless centrally coordinated. The complexities of negotiated hopping pattern and rate might require extension of the 802.15.3 MAC.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **99**

Rypinski, Chandos — Individual

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

The best that can be said for the MBOFDM proposal is that it may work in enough places, for enough of the time to be better than no radio. If deployed, I believe it will be superceded and be replaced by a DSSS type system within the next 18-24 months. This temporary market may be the goal of the MOBOA. I have and will vote against the MB-OFDM proposal for 802.15.3a for the reasons shown below:

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **119**

Siwiak, Kai — Time Derivative

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

The current down-selected PHY, the MB-OFDM proposal continues to have serious issues. The PHY has evolved significantly from the original Multiband proposal which had clear UWB characteristics to one that has the disadvantages associated with a highly complex narrow band radio solution.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **132**

Welborn, Matt — Motorola, Inc.

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

I believe that the complexity of the k=7 covolutional decoder is too high for higher rate (480 Mbps) implementations. The proposal should be revised to use a less complex FEC code.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **137**

Zyren, Jim — Conexant Systems, In

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

MBOA is a great proposal in a lot of dimensions. However, the complexity of the MBOA proposal is not scalable. As stated above, I feel that the predominant application for UWB will be cable replacement. For low cost, short range, battery-powered apps, a lower complexity waveform might be much better suited. Unfortunately, the basic transceiver and baseband processor capabilities required to support OFDM make it difficult to envision a " low complexity" version of MBOA for cable replacement apps.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **89**

Rasor, Gregg — Motorola, Inc.

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

Co-location capability is demonstrated with portable electronic devices such as cell phones, portable MP3 players, etc.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **3**

Adams, Jon — Motorola, Inc.

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

As with all technologies, what we think now is the best approach is often proved wrong or at least inadequate with future progress. The common signaling mode approach is a reasonable approach to dealing with this. The MBOA must include this in their proposal in order to provide a clear method for other spectrum users to be able to communicate with the MBOA equipment partially for good stewardship of shared spectrum and partly because none of us are clairvoyant enough to know the future.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **29**

Barr, John — Motorola, Inc.

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

The third reason I voted no is because the MB-OFDM approach is extremely complex compared to the new DS-UWB proposal (3-4X), cannot scale to the higher data rates that will be necessary, and will consume more power than necessary for handheld/mobile products.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **13**

Chang, Soo-Young — University of California,

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

interoperability with other type of UWB devices Interoperability function is desirable to be able to communicate with other type of devices. If small number of circuit elements/gates are needed to add this function, it can be added.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **20**

Dydyk, Michael — Consultant

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

Because the MB-OFDM solution is unproven and has regulatory uncertainty.

SuggestedRemedy

I will consider changing my no vote to a yes if the common signaling mode is adopted and both the MB-OFDM solution and the DS-UWB solution are included in the standard.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **21**

Emami, Shariar Motorola, Inc.

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

MOFDM has no mechanism to coexist w/ other UWB users in UWB band. They need to adopt a common signaling scheme to do so.

SuggestedRemedy

I would consider changing my vote if they adopt one.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **36**

Gifford, Ian Consultant

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

I do not think of UWB as a specific technology, but rather as a broad set of regulations (much like ISM). IMO, there should ultimately be room for more than one waveform. After all, we are trying to make decisions on an entirely new area based on essentially zero product experience. For this reason, CSP is appealing.

SuggestedRemedy

I will consider changing my no vote to a yes if the MB-OFDM solution is changed to an OFDM solution.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **32**

Gifford, Ian Consultant

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

Because the MB-OFDM solution is unproven and has regulatory uncertainty.

SuggestedRemedy

I will consider changing my no vote to a yes if the MB-OFDM solution is changed to an OFDM solution.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **41**

Godfrey, Tim Conexant Systems, In

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

A Common Signaling Mode is needed to support multiple types of PHYs. This mechanism provides a way to move past the current impasse today. It also provides a framework for allowing the support of new higher rate waveforms in the future, while maintaining backward compatibility. If such a mechanism had been included in the original 802.11 standard, the development of 802.11g and 802.11n would be simplified.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **43**

Gorday, Paul Motorola, Inc.

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

As an alternative, a combination of the MBOFDM and DSUWB proposals along with a common signaling mode could be adopted, so that there is confidence that at least one of the PHY modes will meet the current FCC requirements.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **49**

Heberling, Allen Motorola, Inc.

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

Refusal to Compromise: I voted NO for the MB-OFDM proposal because the advocates for the MB-OFDM proposal refused to consider any compromise to their current proposal.

SuggestedRemedy

However, I will consider changing my NO vote to YES if the MB-OFDM advocates will adopt the Common Signaling Mode and frequency allocation modifications included in the compromise proposal presented by M. Wellborn earlier this week.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **52**

Heubaum, Karl — Motorola, Inc.

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

I voted against confirmation of the MB-OFDM proposal because its proponents have refused to acknowledge that multiple UWB PHYs will see real world deployment. The task group has identified an approach -- the Common Signaling Mode -- that's relatively easy to implement and enables multiple UWB PHY technologies to peacefully coexist, thereby avoiding the interference problems we've seen with IEEE 802.11b/g, Bluetooth, and other technologies that share the 2.4GHz ISM band.

SuggestedRemedy

I will consider changing my no vote to yes if the MB-OFDM proposal is changed to include support for the Common Signaling Mode.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **55**

Hoghooghi, Michael M. — Motorola, Inc.

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

Inflexibility of the MBOA Coalition I voted NO for the MB-OFDM proposal because the supporters of the MB-OFDM proposal refuse to consider any compromise to their current proposal. They have maintained a very inflexible position all the way through and continue to exhibit total inflexibility or collaboration in any possible option to converge or provide alternative joint or complimentary proposal.

SuggestedRemedy

However, I will consider changing my NO vote to YES if the MB-OFDM advocates will adopt the Common Signaling Mode and frequency allocation modifications included in the compromise proposal presented by M. Wellborn earlier this week.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **61**

Kinney, Pat — Kinney Consulting LLC

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

I would change my no vote to a yes confirmation if: It would include a common signaling mode that would provide the baseline connectivity to allow a DS-UWB device to interoperate with an MB-OFDM device.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **62**

Kleindl, Günter — Siemens

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

I prefer the 'compromise proposal' which combines MB-OFDM and DS-CDMA as 2 modes (which can talk to each other) into one standard, because this:
(a) supports a wider variety of applications and
(b) provides an implementation alternative, in case one of the modes can not be used, e.g. because of regulatory limitations.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **64**

Kohno, Ryuji — NICT aka CRL

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

Necessity of Common Signaling Mode (CSM) Even if any scheme is approved to be an IEEE802.15.3a standard, some other UWB compliant scheme to a regulation can cooperate in the same area with the same band.
(2-1)How can you avoid mutual interference between different UWB systems?
(2-2)A sensor network of IEEE802.15.4a may share the same band with WPAN of IEEE802.15.3a. Without CSM, how can you share the band? There is a common controlling channel between IEEE802.11b and 11g at 2.4GHz band to avoid mutual interference.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **68**

Martin, Frederick — Motorola

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

It is becoming clear that opportunity to define a single dominant PHY in the UWB space is slipping away from us. Given this new reality, the current proposal needs to be expanded to address co-existence and cooperation with other PHY layers.

SuggestedRemedy

I would consider changing my NO vote to YES if this issue is addressed.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **152**

Mc Laughlin, Michael — decaWave LLC

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

The clock frequencies and convolutional coder do not support a common signaling mode.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **145**

McInnis, Michael — The Boeing Company

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

This M-OFDM proposal relies too heavily on the development of future CMOS chip technology (year 2005 or beyond) for expansion into the Band Groups 3, 4, and 5. The future CMOS technology that M-OFDM proposers are relying on may not arrive as soon as the proposers have predicted and there is no guarantee that new CMOS technology will perform in Band Groups 3, 4 and 5 efficiently enough to expand this proposal into the higher band groups as proposed by M-OFDM backers in the future.
5a) In addition, it is probable that both non-IEEE 802 based UWB PHYs and IEEE 802 based UWB PHYs will be operating in and contending with each other for UWB spectrum. A Common Signaling Method or Mode as described in IEEE 802.15 documents 15-04-0079-03-003a and 15-04-0081-02-003a, or a like CSM proposal from MBOA M-OFDM proposers, must be embraced and adopted by the MBOA M-OFDM proposers to ensure peaceful coexistence of multiple UWB PHYs operating within UWB band(s). The marketplace would pressure non-IEEE UWB PHY adopters into utilizing the IEEE UWB CSM mechanism. With a UWB band CSM mechanism in place perhaps we could agree to a dual IEEE 802.1.3a UWB PHY arrangement where an M-OFDM PHY operates in the lower UWB band separately but simultaneously with a DS-UWB PHY which has shifted its operation to the upper UWB band where the M-OFDM proposal lacks the capability to function at this time.

SuggestedRemedy

THE BOTTOM LINE I WILL CONSIDER CHANGING MY NO VOTE TO A YES VOTE IF THE MBOA M-OFDM PROPOSAL CAN PROVE UNEQUIVOCALLY THAT THE PROPOSAL IS COMPLIANT TO THE FCC UWB RULES AS IT IS CURRENTLY PROPOSED, DOES NOT SUFFER A PERFORMANCE DETRIMENT RELATIVE TO WHAT HAS BEEN PROPOSED AS A RESULT OF COMPLYING WITH THE FCC UWB RULES, THE MBOA M-OFDM PHY PROPOSAL IS SHOWN TO PROVIDE LESS INTERFERENCE TO LICENSED SATELLITE SERVICES OPERATING WITHIN THE UWB BAND THAN THE DS-UWB PROPOSAL DOES, AND THE M-OFDM PROPOSERS EMBRACE AND ADOPT A COMMON SIGNALLING METHOD OR MODE TO ENABLE PEACEFUL CO-EXISTENCE OF ALTERNATE UWB PHYs WITHIN THE UWB BAND.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **80**

Odman, Knut — Motorola, Inc.

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

Adaptability to current and future standards We are trying to make decisions on an entirely new area based on essentially zero product experience. As with all technologies, what we think now is the best approach is often proved wrong or at least inadequate with future progress. The common signaling mode approach is a reasonable approach to dealing with this. There is also precedence for a multiple Phy support compromise from 802.11, where the standard supports DSSS, FHSS and IR but the market eventually selected DSSS.

SuggestedRemedy

I would consider changing my no vote to yes if the MB-OFDM Authors adopts the compromise proposal including the CSM and suggested frequency allocation modification included in the compromise proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **84**

Pardee, Jack — innov8rs, LLC

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

During this week's presentations, significant enhancements to support flexibility for future developments were reported based in additional consideration of user and developer needs. This potentially very positive development supports my earlier and continuing contention that the working group has been asked prematurely to make a decision on a single Alternative Phy. Limited participation by the Merged Proposal #1 team in the ad hoc exploration of the Common Signal Mode proposal is a troubling sign that they are not serious about developing a consensus standard. Worse yet, in that regard, was the rejection of the motion on Monday to "...critically examine the work done by the February ad-hoc meeting, and before this week's down selection, present their views on whether a compromise is possible between the remaining merged proposals…" that led to a full day mid-meeting recess of the assembled working group.

SuggestedRemedy

I would consider changing my No vote to a Yes if the Common Signal Mode proposal is fairly evaluated and new options explored leading to a non-partisan agreement that it should either be included as part of the standard, or that the concept is infeasible.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **86**

Rasor, Gregg — Motorola, Inc.

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

The UWB PHY is selected from at least two options using the common signaling mode examined in the San Diego ad-hoc, the two options being MB-OFDM and DS-UWB.

SuggestedRemedy

I will consider changing my NO vote to a YES if the following considerations are fully satisfied:

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **106**

Santoff, John — PulseLINK, Inc.

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

The proposal still does not address coexistence with other users in the UWB band, particularly other potential UWB users in the band, even though several coexistence mechanisms have been proposed within the framework of 802.15.3a.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **110**

Schuster, Tom — Intermec Technologies

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

'TomS said "that CSM has not received enough consideration and needs to be reviewed more closely by MB-OFDM."

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **118**

Shvodian, Bill — Motorola, Inc.

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

Because the MB-OFDM solution is unproven and has regulatory uncertainty,

SuggestedRemedy

I will consider changing my no vote to a yes if the common signaling mode is adopted and both the MB-OFDM solution and the DS-UWB solution are included in the standard.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **121**

Siwiak, Kai — Time Derivative

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

The proposal still does not address coexistence with other users in the UWB band, particularly other potential UWB users in the band, even though several coexistence mechanisms have been proposed within the framework of 802.15.3a. In fact, the trade block MBOA have actively pursued the blocking coexistence work.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **125**

Wang, Jerry — Consultant

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

FCC The DS-UWB team proposed a common signaling mode discussion in Vancouver, and has done due diligence. I believe this is an honorable endeavor and effective approach for UWB to get to market marketplace. Unless both sides sit down to hash out the differences, I can't confirm.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **130**

Welborn, Matt — Motorola, Inc.

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

Because the MB-OFDM solution is unproven and has regulatory uncertainty.

SuggestedRemedy

I will consider changing my no vote to a yes if the common signaling mode is adopted and both the MB-OFDM solution and the DS-UWB solution are included in the standard.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **133**

Wilson, Richard — Independent

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

I will change my No vote to Yes if the Common Signaling Mode work can be agreed as a method for allowing us to move forward and improve the time to market; allowing companies to safely continue with IEEE expectation of a merged phy potential at least at some basic level.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **135**

Zhang, Honggang — NICT aka CRL

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

Necessity of Common Signaling Mode (CSM) Even if any proposal is approved to be an IEEE802.15.3a standard, some other UWB schemes compliant to IEEE 802.15 or other regulations can cooperate in the same area within the same band. That is why I do believe that global harmonization and compromise, namely Common Signal Mode (CSM) is so important and necessary. However, I could not find any related improvement with respect to CSM in recent MB-OFDM proposal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **138**

Zyren, Jim — Conexant Systems, In

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

I do not think of UWB as a specific technology, but rather as a broad set of regulations (much like ISM). IMO, there should ultimately be room for more than one waveform. After all, we are trying to make decisions on an entirely new area based on essentially zero product experience. For this reason, CSP is appealing.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **26**

Fisher, Reed — Oki Electric Industry C

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

In the not so far away analog AMPS days (late 1980s), the system proponent built and field tested his system. He then went to a Standards body and got a system Standard. He did not show up with viewgraphs and simulations claiming that his system was the best. I am suspicious of hastily put-together consortiums such as the MB-OFDM. More time must be allocated for further study and possible hardware demonstrations.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **95**

Rasor, Gregg — Motorola, Inc.

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

Substantiated proof (real radios!!!) that the proposed signal processing sections are realizable and less complex than those seen in 802.11a IC's.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **88**

Rasor, Gregg — Motorola, Inc.

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

A complete working MB-OFDM radio is demonstrated that meets all selection criteria AND implements effective protection (deleted tones, etc.) for specific licensed services and reserved bands without degrading information throughput to a level less than 95% of the expected maximum for the selected operating mode.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **37**

Gifford, Ian — Consultant

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

There is precedent for a “two-wave form” compromise. 802.11 initially had 3 separate physical layers: DSSS, FHSS, and IR. The IR solution never really made it to market, but DSSS and FHSS products both gained a degree of market acceptance. Although the presence of two waveforms did result in some market confusion, the agreement to adopt more than one waveform is what enabled IEEE 802.11 to move forward into the market place rather than to remain stalled in the standards process (as it in fact was) for a prolonged period. Due to technical advances that were largely unforeseen at the time the baseline 802.11 Standard was adopted, DSSS eventually became the predominant waveform. Hopefully there is no disagreement that 802.11 has become tremendously successful. I would argue that the success of 802.11 is due in no small part to a very pragmatic compromise that broke a stalemate that was at least as contentious as what we are currently experiencing in 802.15.3a.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **74**

McCorkle, John — Motorola, Inc.

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

Two non-mandatory interoperable modes are included, an MB-OFDM mode, and a DS-UWB mode.
(A) There is precedent for a “two-waveform” compromise. 802.11 initially had 3 separate physical layers: DSSS, FHSS, and IR. The IR solution never really made it to market, but DSSS and FHSS products both gained a degree of market acceptance. Although the presence of two waveforms did result in some temporary market confusion, the agreement to adopt more than one waveform is what enabled IEEE 802.11 to move forward into the market place rather than to remain stalled in the standards process (as it in fact was) for a prolonged period. Due to technical advances that were largely unforeseen at the time the baseline 802.11 Standard was adopted, DSSS eventually became the predominant waveform. Hopefully there is no disagreement that 802.11 has become tremendously successful. The success of 802.11 is due in no small part to a very pragmatic compromise that broke a stalemate that was at least as contentious as what we are currently experiencing in 802.15.3a.
(B) There is a significant time-to-market issue with MB-OFDM since it has never been built and has not had years of use and refinement. It is not prudent to restrict the standard to this unproven proposal.
(C) The common signaling mode included in the DS-UWB standard requires insignificant changes to the MB-OFDM proposal (maybe 100 gates out of 600k gates), yet provides an elegant way to allow both the MB-OFDM and DS-UWB solutions to coexist cooperatively. Given the minimal changes required, and the tremendous benefits, I see no reason to accept going forward with a proposal without it.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **79**

Odman, Knut — Motorola, Inc.

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

Complexity The basic transceiver and baseband processor capabilities required to support OFDM make it difficult to envision a "low complexity" version of MBOA for cable replacement apps.

SuggestedRemedy

I would consider changing my no vote to yes if the MB-OFDM Authors either change their approach to a direct sequence method or at the very least allow the direct sequence approach be part of a standard through a common signaling method.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **103**

Rypinski, Chandos Individual

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

Probably, I would vote in favor of both and OFDM and a DSS phy with common initial access system motivated not by better regard for the OFDM proposal but by the desire to have at least one workable result from the work done.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **127**

Wang, Jing Consultant

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

Because of uncertainty and problems associated with the MB-OFDM proposal, it is much safer for this group to include DS-UWB as an alternative PHY. I consider the DS-UWB proposal, which operates in either DS or OFDM modes, is an acceptable compromise that will allow the TG3A to get out of the stalemate and move on. In fact, the attitude of some authors from the MB-OFDM camp, who repetitively refused cooperation and compromises suggested by the other team, is very damaging. The group should consider an approach (or technical compromise) similar to that adopted by 802.11 allowing multiple "physical operating modes" under the CMS scheme proposed by the DS-USB camp. I urge the task group to direct the Chair to work with both teams to ensure that we make positive progress, so people's time and company's resources are not wasted.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **139**

Zyren, Jim Conexant Systems, In

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

There is precedent for a “two-wave form” compromise. 802.11 initially had 3 separate physical layers: DSSS, FHSS, and IR. The IR solution never really made it to market, but DSSS and FHSS products both gained a degree of market acceptance. Although the presence of two waveforms did result in some market confusion, the agreement to adopt more than one waveform is what enabled IEEE 802.11 to move forward into the market place rather than to remain stalled in the standards process (as it in fact was) for a prolonged period. Due to technical advances that were largely unforeseen at the time the baseline 802.11 Standard was adopted, DSSS eventually became the predominant waveform. Hopefully there is no disagreement that 802.11 has become tremendously successful. I would argue that the success of 802.11 is due in no small part to a very pragmatic compromise that broke a stalemate that was at least as contentious as what we are currently experiencing in 802.15.3a.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **1**

Adams, Jon Motorola, Inc.

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

I remain concerned that the MBOA approach cannot meet FCC and other regulatory body requirements without power reduction which in turn will severely impact range or performance. At this time, the NTIA is undertaking to perform testing that may indeed resolve this question. This report should be available later this year. Let's see what a truly independent body that has strong expertise in the wireless space has to say.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **5**

Ballentine, Paul — Motorola, Inc.

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

The main reason I voted not to confirm the MB-OFDM solution is that it still has not addressed the regulatory uncertainty that surrounds this proposal. There is work going on both at the FCC and at the NTIA to evaluate the relative levels of interference caused by the multiband approach, and it does not make any sense to confirm a standard that may not be allowed by even the FCC, let alone the regulatory agencies in other countries that may have even more concern over interference caused by UWB. The updated MERGED PROPOSAL #2 a.k.a. DS-UWB is free of regulatory barriers. The DS-UWB authors updated their proposal -04/137r0 and -04/140r1 and provided an alternative approach of developing a single PHY standard that allows compliant UWB devices to use either DS-UWB or MB-OFDM, yet still allows all compliant devices to interoperate and coordinate their use of the shared UWB spectrum.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **7**

Barr, John — Motorola, Inc.

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

The main reason I voted not to confirm the MB-OFDM solution is that it still has not addressed the regulatory uncertainty that surrounds this proposal. There is work going on both at the FCC and at the NTIA to evaluate the relative levels of interference caused by the multiband approach, and it does not make any sense to confirm a standard that may not be allowed by even the FCC, let alone international regulatory bodies that have even more concern over interference caused by UWB. The updated MERGED PROPOSAL #2 a.k.a. DS-UWB is free of regulatory barriers. The DS-UWB authors updated their proposal -04/137r0 and -04/140r1 and provided an alternative approach of developing a single PHY standard that allows compliant UWB devices to use either DS-UWB or MB-OFDM, yet still allows all compliant devices to interoperate and coordinate their use of the shared UWB spectrum.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **9**

Bourgeois, Monique — Motorola, Inc.

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

There are still open questions as to whether the MB-OFDM proposal will be ruled legal by the FCC. We should not pass this proposal unless we have the go ahead from the FCC.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **10**

Callaway, Ed — Motorola, Inc.

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

I am still troubled by the apparent contradiction between the selected proposal and the FCC UWB regulations on frequency hopping, which seem quite clear to me and require a power reduction that would leave the proposal with an extremely short range.

SuggestedRemedy

I could change my vote to a "yes" vote if a more conventional UWB modulation were selected, rather than OFDM.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **14**

Chang, Soo-Young — University of California,

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

average power used to satisfy FCC mask Since frequency hopping scheme is used, it is needed to verify that currently proposed power budget is allowed under the FCC mask.

SuggestedRemedy

If they are solved, I would like to vote "yes".

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **15**

Choi, Sangsung ETRI

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

The main reason I voted not to confirm the MB-OFDM proposal is that the regulatory uncertainty is still not solved. There is work going on both at the FCC and at the NTIA to evaluate the relative levels of interference caused by the frequency hopping scheme, but it does not make any sense to confirm the proposal.

SuggestedRemedy

I will consider changing my no vote to a yes vote if the MB-OFDM Proposal can be shown that their proposal is compliant with the FCC regulations.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **16**

Dydyk, Michael Consultant

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

I have doubts as to the ruling of FCC and NTIA on the approach taken by Proposal #1.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **23**

Emami, Shariar Motorola, Inc.

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

Regulatory issues with MBOA are not solved yet.

SuggestedRemedy

I would consider changing my vote if FCC approves MBOA.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **27**

Fisher, Reed Oki Electric Industry C

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

Concerning the posssible FCC problems:

SuggestedRemedy

I will consider changing my no vote to a yes vote if the MB-OFDM proponents can show that their proposal is compliant with the FCC regulations and does not show a performance detriment relative to non-MB-OFDM proposals as a result of FCC rules. An example would be to have a working prototype that obtains FCC approval under 47 CFR part 15.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **28**

Gifford, Ian Consultant

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

The main reason I voted not to confirm the MB-OFDM solution is that it still has not addressed the regulatory uncertainty that surrounds this proposal. There is work going on both at the FCC and at the NTIA to evaluate the relative levels of interference caused by the multiband approach, and it does not make any sense to confirm a standard that may not be allowed by even the FCC, let alone international regulatory bodies that have even more concern over interference caused by UWB. The updated MERGED PROPOSAL #2 a.k.a. DS-UWB is free of regulatory barriers. The DS-UWB authors updated their proposal - 04/137r0 and -04/140r1 and provided an alternative approach of developing a single PHY standard that allows compliant UWB devices to use either DS-UWB or MB-OFDM, yet still allows all compliant devices to interoperate and coordinate their use of the shared UWB spectrum.

SuggestedRemedy

Consequently, I will consider changing my NO vote to YES if the MBOA provides

1) Unequivocal proof that their proposal is compliant with both the FCC and NTIA regulatory rulings regarding UWB emissions.

2) proof that their proposal does not suffer a reduction in performance relative to non-FH proposals as a result of FCC and NTIA rulings.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **34**

Gifford, Ian — Consultant

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

Based on the FCC allowable power limit of -41 dBm / MHz, UWB will, in my opinion, be best suited to short range cable replacement applications Even at these short ranges, the reliability of MBOA-based systems will rely heavily on an interpretation of the FCC rules which will permit higher instantaneous transmitted power via the use of frequency hopping. This assumption/interpretation may very well prove to be accurate. However, at this time it is very difficult to predict how the FCC will ultimately rule on this issue. If the MBOA interpretation is inaccurate and the FCC does not permit use of higher instantaneous transmit power for FHSS systems, the effectiveness of the MBOA-based devices will be seriously hindered because of the severe range limitations that will result. In either case, resolution of this issue could cause protracted delay in market introduction.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **30**

Gifford, Ian — Consultant

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

There have been claims that the MB-OFDM solution always causes less interference than legal impulse radio solutions, but there are cases where the MB-OFDM interference is worse than impulse radio.

SuggestedRemedy

I will consider changing my no vote to a yes when the NTIA signs off that the MB-OFDM solution -03/268r3 does not ever cause more interference than that specified in the FCC rules.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **40**

Godfrey, Tim — Conexant Systems, In

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

The FCC has not yet ruled on the MB-OFDM waveform and the use of frequency hopping for UWB. If the FCC does not permit use of higher instantaneous transmit power for FHSS systems, the effectiveness of the MBOA-based devices will be seriously hindered because of the severe range limitations that will result.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **159**

Gutierrez, Jose — Eaton Corporation

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

Adopting a solution that can be use today will be more beneficial for the market.

SuggestedRemedy

My vote will change at the moment it is shown to me evidence that the technology will conform with regulations (for the entire set of environments where the technology is planned to be deployed).

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **158**

Gutierrez, Jose — Eaton Corporation

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

There is no need to make a technology push for something where the FCC will block.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **45**

Heberling, Allen — Motorola, Inc.

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

Regulatory: As I stated during the July 2003 meeting of the 802.15.3a held in San Francisco, "I voted NO on the MB-OFDM proposal because it was unable to produce documentation that it had obtained FCC regulatory approval for their modulation scheme." It is now March of 2004 and the 802.15.3a Task group has yet to receive any documentation that would address my concern.

SuggestedRemedy

Consequently, I may consider changing my NO vote to YES if the MBOA provides 1) Unequivocal proof that their proposal is compliant with the FCC regulatory rulings regarding UWB emissions. 2) proof that their proposal does not suffer a reduction in performance relative to non-FH proposals as a result of an FCC ruling.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **51**

Heubaum, Karl — Motorola, Inc.

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

I voted against confirmation of the MB-OFDM proposal because measurements and analysis performed thus far indicate it will generate greater interference than the DS-CDMA proposal. This has significant consequences for regulatory approval of the MB-OFDM PHY in the U.S. and in other countries, and is the subject of testing at the NTIA.

SuggestedRemedy

I will consider changing my no vote to yes if the MB-OFDM proposal can be demonstrates to generate less interference than the DS-CDMA proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **56**

Hoghooghi, Michael M. — Motorola, Inc.

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

Regulatory As I stated in July 2003 during the 802.15.3a meeting in San Francisco, "I voted NO on the MB-OFDM proposal because it was unable to produce documentation that it had obtained FCC regulatory approval for their modulation scheme." It is now March of 2004 and the 802.15.3a Task group has yet to receive any documentation that would address my concern.

SuggestedRemedy

Consequently, I may consider changing my NO vote to YES if the MBOA provides

1) Unequivocal proof that their proposal is compliant with the FCC regulatory rulings regarding UWB emissions.
2) Proof that their proposal does not suffer a reduction in performance relative to non-FH proposals as a result of an FCC ruling.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **146**

Mc Laughlin, Michael — decaWave LLC

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

The FCC has specifically discouraged frequency hopping schemes for UWB.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **141**

McInnis, Michael — The Boeing Company

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

M-OFDM compliance with FCC UWB rules has not adequately been addressed by the M-OFDM proposers and is still in question.

SuggestedRemedy

A written FCC ruling, or an FCC licensed M-OFDM radio, is required to resolve this matter.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **142**

McInnis, Michael — The Boeing Company

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

All link budget assumptions in the M-OFDM proposal are questionable and cannot be relied upon as being accurate until the FCC comments on whether or not the RF power level utilized by the "gated" or "hopping" M-OFDM PHY proposal is allowed by current FCC UWB rules. This issue has not been adequately addressed by the M-OFDM proposers.

SuggestedRemedy

A written FCC ruling, or an FCC licensed M-OFDM radio, is required to resolve this matter.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **156**

Naeve, Marco — Eaton Corporation

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

From everything that we have seen it is still not apparent that the MBOA solution will pass FCC type acceptance in practical environments at the specified performance, such as 100Mbps@10m.

SuggestedRemedy

If this can be shown then I will consider changing my no vote.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **75**

Ngo, Chiu — Samsung

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

The issue on FCC regulation about interference generated by MB-OFDM is still un-resolved.

SuggestedRemedy

I will consider changing my vote to yes if the group proposing the MB-OFDM solution resolves the above issues.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **81**

Ogawa, Hiroyo — NICT aka CRL

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

I am considering to changing my No vote to a Yes if the MBOFDM proposal can prove that the proposal is compliant to the FFC regulations and does not suffer a performance detriment relative to non-MBODFM proposal as a result of the FCC rules.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **82**

Pardee, Jack — innov8rs, LLC

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

Although addressed, the issue of FCC acceptability of the Merged Proposal #1 has not been adequately resolved.

SuggestedRemedy

I would consider changing my No vote to Yes when this key issue has been resolved with acceptable rigor.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **93**

Rasor, Gregg — Motorola, Inc.

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

The full disclosure of implementation details on alleged MB-OFDM radios fabricated according to the current MB-OFDM proposal, and COMPLETE public disclosure of the FCC testing results presented and performed by TDK Labs, along with a matrix of these devices operating in the presence of in-band victim receivers such as analog and digital C-band TVRO systems.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **87**

Rasor, Gregg — Motorola, Inc.

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

The proposers publicly disclose all FCC and NTIA compliance information resulting from the measurement of radios that are fully compliant with the current MB-OFDM proposal, AND a "green light" for the proposed technology from both agencies in the form of a statement of public record.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **91**

Rasor, Gregg — Motorola, Inc.

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

Proven levels of radiated and conducted emissions are confirmed not only per the FCC rules, but also being sufficiently low to permit co-integration of the resulting devices in units mentioned above.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **96**

Rikuta, Yuko NICT aka CRL

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

I will consider changing my NO vote to a YES if the modified MB-OFDM proposal can prove that the proposal is compliant to the FCC regulations.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **105**

Santoff, John PulseLINK, Inc.

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

The regulatory issues associated with Frequency hopping have not been resolved at the FCC. Would like to see a letter or policy statement from FCC saying UWB frequency hopping as outlined in the proposal is approved.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **111**

Seals, Michael Conexant Systems, In

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

The main reason why I voted no is that the MBOA proposal has still not adequately addressed my regulatory concerns with respect to output power and frequency hopping.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **112**

Shiraki, Yuichi Oki

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

I will consider changing my No to a Yes if the MBOFDM proposal can prove that the proposal is compliant to the FFC regulations and does not suffer a performance detriment relative to non-MBODFM proposal as a result of the FCC rules.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **113**

Shvodian, Bill Motorola, Inc.

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

The main reason I voted not to confirm the MB-OFDM solution is that it still has not addressed the regulatory/interference uncertainty that surrounds this proposal. There is work going on both at the FCC and at the NTIA to evaluate the relative levels of interference caused by the multiband approach, and it does not make any sense to confirm a standard that may not be allowed by even the FCC, let alone international regulatory bodies that have even more concern over interference caused by UWB. The updated MERGED PROPOSAL #2 a.k.a. DS-UWB is free of regulatory barriers. The DS-UWB authors updated their proposal -04/137r0 and -04/140r1 and provided an alternative approach of developing a single PHY standard that allows compliant UWB devices to use either DS-UWB or MB-OFDM, yet still allows all compliant devices to interoperate and coordinate their use of the shared UWB spectrum.

SuggestedRemedy

I would consider changing my no vote to yes if the MB-OFDM Authors incorporate a direct sequence method or at the very least allow the direct sequence approach be part of a standard through a common signaling method.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **115**

Shvodian, Bill Motorola, Inc.

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

There have been claims that the MB-OFDM solution always causes less interference than legal impulse radio solutions, but there are cases where the MB-OFDM interference is worse than impulse radio.

SuggestedRemedy

I will consider changing my no vote to a yes if a neutral body like the NTIA signs off that the MB-OFDM solution never causes more interference than that anticipated by the rules.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **124**

Takizawa, Kenichi — NICT aka CRL

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

I will consider changing my No to a Yes vote if the MB-OFDM proposal proves that the proposal is compliant to the FCC regulations clearly.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **126**

Wang, Jing — Consultant

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

I will consider change my vote from NO to YES for the MB-OFDM proposal only after the following are all resolved to the satisfaction:
*FCC regulatory issues - proof of performance comparable to that of DS-UWB under FCC rules.
*Scalability for simple applications.
*Ranging and location awareness support.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **136**

Zyren, Jim — Conexant Systems, In

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

My reasons for voting “No” on the 802.15.3a confirmation vote on Tuesday March 16:

Based on the FCC allowable power limit of -41 dBm / MHz, UWB will, in my opinion, be best suited to short range cable replacement applications Even at these short ranges, the reliability of MBOA-based systems will rely heavily on an interpretation of the FCC rules which will permit higher instantaneous transmitted power via the use of frequency hopping. This assumption/interpretation may very well prove to be accurate. However, at this time it is very difficult to predict how the FCC will ultimately rule on this issue. If the MBOA interpretation is inaccurate and the FCC does not permit use of higher instantaneous transmit power for FHSS systems, the effectiveness of the MBOA-based devices will be seriously hindered because of the severe range limitations that will result. In either case, resolution of this issue could cause protracted delay in market introduction.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **2**

Adams, Jon — Motorola, Inc.

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

I am concerned that by the time products based upon this technology are generally available (2-4 years) that the data rate requirements will have exceeded 500Mbps. The MBOA has withdrawn their high data rate option from their proposal. Are we creating immediate obsolescence if we select this approach? Please show data rate options to 2Gbps to ensure future growth.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **6**

Ballentine, Paul — Motorola, Inc.

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

A second reason I voted no is because there is still no proof that the MB-OFDM approach can even meet the performance requirements set by the PAR. The DS-UWB approach has been implemented by at least two companies and has been shown to be capable of meeting the PAR requirements.

SuggestedRemedy

Therefore, I would consider changing my no vote to yes if the MBOFDM proposers either change their approach to a direct sequence method or at the very least allow the direct sequence approach be part of a standard through a common signaling method.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **8**

Barr, John — Motorola, Inc.

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

A second reason I voted no is because there is still no proof that the MB-OFDM approach can even meet the performance requirements set by the PAR. The DS-UWB approach has been implemented by at least two companies and has been shown to be capable of meeting the PAR requirements.

SuggestedRemedy

Therefore, I would consider changing my no vote to yes if the MB-OFDM Authors either change their approach to a direct sequence method or at the very least allow the direct sequence approach be part of a standard through a common signaling method.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **19**

Dydyk, Michael — Consultant

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

I am concerned that by the time products based upon this technology are generally available (2-4 years) that the data rate requirements will have exceeded 500Mbps. The MBOA has withdrawn their high data rate option from their proposal. Are we creating immediate obsolescence if we select this approach?

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **38**

Gifford, Ian — Consultant

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

I am concerned that by the time products based upon this technology are generally available (2-4 years) that the data rate requirements will have exceeded 500Mbps. The MBOA has withdrawn their high data rate option from their proposal. Are we creating immediate obsolescence if we select this approach? Please show data rate options to 2Gbps to ensure future growth.

SuggestedRemedy

I may be able to change my NO vote when sufficient answers to the above issues are adequately addressed.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **48**

Heberling, Allen — Motorola, Inc.

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

High Bit Rate Capability: I voted NO for the MB-OFDM proposal because most recent presentation indicated that tit no longer provides support for previously claimed data rates.

SuggestedRemedy

Consequently, I will consider changing my NO vote to a YES if the MB-OFDM advocates can provide a demonstrable chip implementation.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **53**

Heubaum, Karl — Motorola, Inc.

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

I voted against confirmation of the MB-OFDM proposal because its most recent revision dropped support for previously claimed high data rates. These data rates will be important in short range cable replacement use cases.

SuggestedRemedy

I will consider changing my no vote to yes if the MB-OFDM proposal demonstrates support for these previously claimed high data rates.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **59**

Hoghooghi, Michael M. — Motorola, Inc.

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

High Bit Rate Capability I voted NO for the MB-OFDM proposal because most recent presentation indicated that tit no longer provides support for previously claimed data rates.

SuggestedRemedy

Consequently, I may consider changing my NO vote to a YES if the MB-OFDM proposal reinstates demonstrable support for its previously claimed higher data rates.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **69**

Martin, Frederick — Motorola

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

I find the higher optional rates presented in the latest update of the DSSS approach to be compelling. I would like to see how OFDM can address this opportunity.

SuggestedRemedy

I would consider changing my NO vote to YES if this issue is addressed.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **149**

Mc Laughlin, Michael — decaWave LLC

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

The 480 Mbps mode has very poor performance.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **71**

McCorkle, John — Motorola, Inc.

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

The MB-OFDM proposal can be modified to include extended modes that allow the data-rate to be at least twice as fast as its current top rate. I do not believe there is any good reason to pick a standard that cannot grow to support higher data rates, especially to serve the ultra low power handheld device market.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **157**

Ngo, Chiu — Samsung

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

The band plan of the MB-OFDM proposal has been changed. However, its performance compared to the previous version of the proposal was not clear.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **77**

Odman, Knut — Motorola, Inc.

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

Performance It is uncertain that merged proposal #1 can meet the PAR and scale up to data rates >= 500 Mbps especially after removing the high data rate option from the proposal.

SuggestedRemedy

I will consider changing my vote to yes if the proponents can show a scalability up to higher data rates in the current proposal, alternatively adding a high data rate option.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **83**

Pardee, Jack — innov8rs, LLC

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

Recent changes in Merged Proposal #1 and Merged Proposal #2 have been made than that appear to improve performance in several important ways. Limited time and inadequate access to details of tests and simulations made it impossible to evaluate and fairly assess the merits of Merged Proposal #1 relative to Merged Proposal #2. In particular, I have concerns over the relative power/performance characteristics of Merged Proposal #1 for handheld applications. The complexity of the base mode design seems burdensome compared to the reported simplicity available in Merged Proposal #2. Changes to remove the high data rate option from Merged Proposal #1 raise scaling issues that warrant further evaluation before confirmation.

SuggestedRemedy

I would consider changing my No vote to a Yes when the two merged proposals have been fairly compared based on the most current revs of the supporting documents and when the authors of each proposal agree that the other proposal team is using a fair model and/or characterization of their work.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **101**

Rypinski, Chandos — Individual

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

The availability of the higher rates will not be predictably available because of degradation from "like-signal" interference with large area coverage applications. Resistance to like-signal interference is inversely proportional to the precision of measurement of phase and amplitude required in the demodulation process. The most robust are two, three and four level codes. The least robust are those using phase amplitude constellations of 16 and other higher order values. The benefit of the higher order is less occupied frequency space for a given data transfer rate. This particular advantage is not only not required, but it is also precludes the benefit of lower required power-per-bit transmitted.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **131**

Welborn, Matt — Motorola, Inc.

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

The MB-OFDM approach suffers from Raleigh fading which significantly degrades performance, esp. at higher data rates. Some solution needs to be devised and demonstrated that can effectively overcome the Rayleigh fading effects at high data rates.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **33**

Gifford, Ian — Consultant

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

The MB-OFDM solution uses band hopping which increases interference in order to reduce complexity.

SuggestedRemedy

I will consider changing my no vote to a yes if the common signaling mode is adopted and both the MB-OFDM solution and the DS-UWB solution are included in the standard.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **42**

Gorday, Paul — Motorola, Inc.

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

In my opinion, the issues related to both interference and FCC compliance of frequency hopping have not been satisfactorily resolved.

SuggestedRemedy

I will consider changing my "no" vote to "yes" if the MBOFDM proposal can be modified such that it has the same, or better, interference characteristics as the DS-UWB proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **44**

Heberling, Allen — Motorola, Inc.

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

Interference: I voted NO on the MB-OFDM proposal because reported analyses have indicated that current MB-OFDM proposal is more interfering than DS-UWB.

SuggestedRemedy

I will consider changing my vote from NO to YES if the MB-OFDM proposal can be demonstrably shown to be less interfering than DS-UWB without any loss in performance, range or robustness.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **58**

Hoghooghi, Michael M. — Motorola, Inc.

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

Interference I voted NO on the MB-OFDM proposal because reported analyses have indicated that current MB-OFDM proposal is more interfering than DS-UWB.

SuggestedRemedy

I will consider changing my vote from NO to YES if the MB-OFDM proposal can be shown demonstrably to be less harmful (or less interfering) than DS-UWB to other systems.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **63**

Kohno, Ryuji NICT aka CRL

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

Avoidance of interfere to coexisting systems MB-OFDM proposal has a function that either subbands or tones in the overlapped band with signals of coexisting systems can be tuned off in order to avoid interference to them. However, it has not clearly explained how to detect the signals from coexisting systems. Some successive questions are as follows,
(1-1) How much large is the overhead of software/hardware to detect signals from coexisting systems and to control tuning on/off?
(1-2) How much is performance degradation due to detection error of the coexisting system's signal?
(1-3) If the overlapped bands with coexisting systems is over 50% or more up to 100%, then how can the proposed system keep necessary performance?
(1-4) Why doesn't it apply some sort of spectral shaping like SSA?

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **65**

Kuramochi, Yuzo Motorola, Inc.

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

Interference issue DS-UWB shows less interference than that of MB-OFDM.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **67**

Martin, Frederick Motorola

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

FCC regulations aside, there continues to be a significant perception in the industry that any UWB solution causes unacceptable interference in the presence to existing communications systems. In this environment, we should select as our baseline approach the one with the demonstrated lowest interference. At this time, evidence has been presented to our committee that the OFDM system causes more interference to some satellite TV systems than competing systems. It needs to be shown, definitively, that the OFDM system does not cause more interference than competing systems.

SuggestedRemedy

I would consider changing my NO vote to YES if this issue is addressed.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **147**

Mc Laughlin, Michael decaWave LLC

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

The interference from this proposal is several dBs higher than the DS-UWB proposal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **72**

McCorkle, John Motorola, Inc.

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

The MB-OFDM proposal can be changed to be less interfering than the DS-UWB proposal (for example, on a c-band satellite down link as both groups have looked at). Every analysis and every set of measurements presented to TG3a has shown that DS-UWB has less interference than MB-OFDM. Rather than deriving a benefit from this higher interference (e.g. in lower complexity or higher throughput), the performance is worse. There is NO good reason to accept this higher interference. The MB-OFDM solution causes the same additional interference in a given band as an illegal gated DS-UWB signal with the same duty cycle as the MB-OFDM signal has in a given band.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **143**

McInnis, Michael The Boeing Company

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

Motorola has demonstrated and documented a claim that the proposed M-OFDM PHY causes more interference to MPEG-1 satellite systems co-operating within the UWB band than the DS-CDMA proposal does. It is not enough to cause less interference than an impulse radio already allowed under the current FCC UWB rules, we in the IEEE 802.15.3a Task Group should select the UWB PHY proposal which causes the least amount of interference as possible to any and all co-operating licensed wireless services in the UWB band.

SuggestedRemedy

Only a reduction in demonstrated/simulated M-OFDM interference level to the same, or lower, interference level demonstrated/simulated by the DS-UWB proposal will resolve this matter.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **155**

Naeve, Marco — Eaton Corporation

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

It also seems that the interference from the OFDM hopper system is much more disruptive to licensed systems in the same band when compared to the DSUWM system. It may be necessary to run the MOFDM system at significantly reduced output power to alleviate FCC concerns and therefore rendering this technology unusable for many of the envisioned applications.

SuggestedRemedy

I may consider changing my vote when an independent regulatory body can show that this is not the case.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **92**

Rasor, Gregg — Motorola, Inc.

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

Full disclosure of interference testing results, confirmed by simulation and TESTING a working MB-OFDM radio for in- and out- of band effects on co-located cellular telephone systems such as GSM, CDMA, and WCDMA.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **90**

Rasor, Gregg — Motorola, Inc.

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

The MB-OFDM solution is shown to have equal of less interference that DS-UWB as concluded by the pending NIST study.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **116**

Shvodian, Bill — Motorola, Inc.

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

The MB-OFDM solution causes identical interference in a given band as an illegal gated DS-UWB signal with the same duty cycle as the MB-OFDM signal has in that given band. There was a claim on the TG3a reflector that the FCC is not concerned with illegal signals like gated DS-UWB, only legal signals.

SuggestedRemedy

I will consider changing my no vote to a yes if the MB-OFDM proposal is modified so that it causes no more interference than a legal (non gated) DS-CDMA signal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **114**

Shvodian, Bill — Motorola, Inc.

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

The MB-OFDM solution uses frequency hopping which increases interference as compared to OFDM in order to reduce complexity.

SuggestedRemedy

I will consider changing my no vote to a yes if the MB-OFDM solution is changed to an OFDM solution.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **128**

Welborn, Matt — Motorola, Inc.

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

The MB-OFDM solution uses frequency hopping which increases interference as compared to OFDM in order to reduce complexity.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **140**

McCorkle, John — Motorola, Inc.

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

If the MB-OFDM proposal can be changed to provide a ranging capability that is equal to the DS-UWB proposal. Ranging is an important application and needs to be fully supported by the solution that the IEEE chooses.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **107**

Santoff, John — PulseLINK, Inc.

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

The 242 ns symbol slot has no viable provisions for accurate distance measurements, a defect which can be corrected with 'common signaling mode' needed for coexistence.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **122**

Siwiak, Kai — Time Derivative

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

The 242 ns symbol wavelet has no viable provisions for accurate distance measurements, a defect which can be corrected with 'common signaling mode' needed for coexistence.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **54**

Heubaum, Karl — Motorola, Inc.

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

I am concerned by press stories where members of the MBOA state they've adopted a non-IEEE 802.15.3 MAC for the MB-OFDM PHY proposal:
http://www.commsdesign.com/showArticle.jhtml?articleID=18400469

Within the task group the proponents of the MB-OFDM proposal have stated that their PHY will support the IEEE 802.15.3 MAC, but if this is the case why publicly state outside the task group that they've adopted another MAC? Why wasn't this decision to adopt another MAC included in the updated MB-OFDM proposal delivered to the task group? Is a different MAC required for the MB-OFDM PHY to deliver its claimed performance? If the MBOA delivers on its previous promise to bring the specification it's developing outside of the IEEE 802.15.3a task group back into the task group when it's finished, how do they plan to reconcile this newly adopted MAC with the 802.15.3a PAR, which states the task group is chartered with the responsibility to standardize a high data rate PHY that uses the 802.15.3 MAC?

SuggestedRemedy

I will consider changing my no vote to yes if the MB-OFDM proposal is demonstrated to comply with the 802.15.3a PAR, including support for all claimed data rates when used with the 802.15.3 MAC.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **144**

McInnis, Michael — The Boeing Company

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

The ability of the MB-OFDM proposal to dynamically modify its transmit spectrum to enable coexistence or worldwide regulatory compliance is based on its ability to dynamically turn on or off tones and bands. No mechanism has yet been identified in the M-OFDM proposal to allow devices to coordinate this dynamic modification of the critical link parameters.

SuggestedRemedy

Although the MBOA has stated that this capability exists, an updated M-OFDM PHY proposal document which includes this mechanism still needs to be released to IEEE 802.15.3a in conjunction with all other summary updates and changes provided up to and including those presented at this IEEE 802 March 04 plenary meeting, before this matter can be resolved.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **104**

Santoff, John — PulseLINK, Inc.

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

The PSD of the present proposal specifies the blanking of 6-7 carriers in the center of each 528 MHz band. This creates deep nulls as much as 40 dB in some simulations in the center of the '528 MHz' signal PSD. The resulting FCC derived 'UWB bandwidth is approximately 250 MHz and likely, not permissible under Part 15 (f) of the regulations. This regulatory issue must be solved.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **120**

Siwiak, Kai — Time Derivative

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

The PSD of the present proposal seems to specify the blanking of 6-7 carriers in the center of each 528 MHz band. That makes for a very deep null, as much as 40 dB in some simulations in the center of' the '528 MHz' signal PSD. The resulting FCC derived 'UWB bandwidth is approximately 250 MHz, hence, is, likely, not permissible under Part 15 (f) of the regulations. This regulatory issue must be solved.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **39**

Gifford, Ian — Consultant

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

Further, I have been considering the public announcements and public information on MB-ODFM proposal that have been in the press this week [http://www.eetimes.com/article/showArticle.jhtml?articleId=18400469&kc=6208] "Alliance defines new MAC for UWB networks" EE Times, Patrick Mannion, 16Mar04, etc. and that MB-OFDM Authors should consider the IEEE Industry Standards and Technology Organization (IEEE-ISTO) [http://www.ieee-isto.org/]; the point being that the ISTO develops industry standards but that IEEE 802.15 develops consensus standards; companies vs. individual voluteers respectively.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **97**

Rofheart, Martin — Motorola, Inc.

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

BEST USE OF UWB is high data rate, low power, short range connectivity. MB-OFDM needs to answer how it will supply modes that serve this application rather than the 'one size fits all' longer transmission range approach adopted.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **108**

Santoff, John — PulseLINK, Inc.

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

The proposal has evolved to one which due to complexity issues effectively eliminates the use in battery powered devices that are very energy sensitive like PDAs and cell phones.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **12**

Chang, Soo-Young — University of California,

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

simultaneously operated piconet (SOP) capability Time-frequency coding scheme suggested in MBOA proposal is not able to accommodate more than three piconets.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **25**

Emami, Shariar — Motorola, Inc.

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

There are two many collisions in TF codes in SOP environment.

SuggestedRemedy

I'll consider changing my vote if they rearrange the bands and design TF codes to improve the performance in SOP environment.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **66**

Kuramochi, Yuzo — Motorola, Inc.

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

SOP issue Forcing 4 piconets into 3 frequency bands degrades the performance.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **153**

Mc Laughlin, Michael — decaWave LLC

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

No SOP figures have been presented for more than 1 interfering piconet.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **94**

Rasor, Gregg — Motorola, Inc.

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

Proof that other OFDM based systems exist that operate in similar environments, i.e., uncoordinated overlapping signaling that allows multi-user operation.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **134**

Zhang, Honggang — NICT aka CRL

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

SOP performance I believe that MB-OFDM proposal should improve its SOP performance. Is 3-hop sufficient for multiple piconets coexistence? Just 3 or even 7 hops would limit the multiple accesses and the total system performance.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **31**

Gifford, Ian — Consultant

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

There were NO VOTE COMMENTS submitted in July 2003 that the MB-OFDM solution uses dummy tones in order to meet the 500 MHz minimum bandwidth requirement. The name of the tones was changed to guard tones as an attempt to satisfy the NO VOTE COMMENTS. This does not change the fact that they are unnecessary. 5 of the 6 guard tone groups for mode 1 impact restricted bands. The NTIA says that any device that purposely injects noise into the spectrum in order to meet the FCC minimum bandwidth requirements for UWB should never be certified.

SuggestedRemedy

I will change my no vote to yes if the guard tomes are eliminated from the proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **46**

Heberling, Allen — Motorola, Inc.

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

NO VOTE COMMENTS submitted in July 2003 identified the fact that the MB-OFDM proposal specified the use of dummy tones in order to meet the 500 MHz minimum bandwidth requirement. Subsequently, the MB-OFDM alliance changed the name of the tones from "dummy" to guard tones as an attempt to satisfy the NO VOTE COMMENT. Changing the name of the tones does not change the fact that they are part of the MB-OFDM proposal simply to meet the minimum UWB frequency requirement specified in the FCC R&O. Presentations this week revealed that 5 of the 6 guard tone groups for mode 1 impact restricted bands. The NTIA, an FCC peer regulatory agency, has specified " that any device that purposely injects noise into the spectrum in order to meet the FCC minimum bandwidth requirements for UWB should never be certified.

SuggestedRemedy

Consequently, I will consider changing my NO vote to a YES if the "dummy"/guard tones are eliminated from the MB-OFDM proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **57**

Hoghooghi, Michael M. Motorola, Inc.

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

Earlier submitted NO-VOTE Comments (July 2003) identified the fact that the MB-OFDM proposal specified the use of dummy tones in order to meet the 500MHz minimum bandwidth requirement. Subsequently, the MB-OFDM alliance changed the name of the tones from "dummy" to guard tones as an attempt to satisfy the earlier NO-VOTE COMMENT. Changing the name of the tones does not change the fact that they are part of the MB-OFDM proposal simply to meet the minimum UWB frequency requirement specified in the FCC R&O. Presentations this week revealed that 5 of the 6 guard tone groups for mode 1 impact restricted bands. The NTIA, an FCC peer regulatory agency, has specified "that any device that purposely injects noise into the spectrum in order to meet the FCC minimum bandwidth requirements for UWB should never be certified.

SuggestedRemedy

Consequently, I will consider changing my NO vote to a YES if the "dummy"/guard tones are eliminated from the MB-OFDM proposal altogether.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **148**

Mc Laughlin, Michael decaWave LLC

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

The NTIA have specifically disallowed sending noise to artificially meet the 500MHz lower bandwidth limit.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **73**

McCorkle, John Motorola, Inc.

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

The MB-OFDM proposal can be changed such that it does not emit noise in order to extend its bandwidth to the required 500 MHz. This “no” comment has been on record since last July and has only been addressed by changing the name of the tones from dummy tones, to guard tones. That does not address the problem. The IEEE should not approve a standard that requires broadcasting noise for no other reason than to fill out the bandwidth.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **76**

Odman, Knut Motorola, Inc.

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

Regulatory/Interference To deal with regulatory uncertainty I cannot approve a proposal that has shown demonstrably higher interference than a competing proposal.

SuggestedRemedy

I will consider changing my vote to yes if the MB-OFDM camp can demonstrate a lower interference level than DS-CDMA (not than impulse radio) without emitting noise in order to get 500 MHz bandwidth.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **98**

Rofheart, Martin Motorola, Inc.

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

Still have not adequately addressed regulatory concerns. This includes both interference issues related to GATING and HOPPING as well as issues related to TRANSMITTING NOISE to attain 500 MHz BW.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **100**

Rypinski, Chandos Individual

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

I do not believe it complies with the spirit and word of applicable regulations which forbid waste forbid occupancy of radio spectrum without useful purpose. Further, a portion of the allowable transmitter power is deliberately wasted.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **109**

Santoff, John PulseLINK, Inc.

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

I will change my vote to a 'YES' when:

(1) The PSD issues are resolved concerning 500 MHz UWB bandwidth,
(2) Specific approval from FCC for this proposal
(3) Coexistence is addressed by a common signaling mode,
(4) A simple accurate and effective mechanism for distance measurement is addressed
(5) A solution for energy sensitive devices is shown.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **117**

Shvodian, Bill Motorola, Inc.

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

There were "no" comments in July that the MB-OFDM solution uses dummy tones in order to meet the 500 MHz minimum bandwidth requirement. The name of the tones was changed to guard tones as an attempt to satisfy the no vote comments. This does not change the fact that they are unneeded. 5 of the 6 guard tone groups for mode 1 impact restricted bands. The NTIA says that any device that purposely injects noise into the spectrum in order to meet the FCC minimum bandwidth requirements for UWB should never be certified.

SuggestedRemedy

I will consider changing my no vote to yes if the guard tomes are eliminated from the proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **123**

Siwiak, Kai Time Derivative

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

The proposal has evolved to one which effectively precludes use in devices that are very energy sensitive like PDAs and cell phones. I will change my vote to a hearty 'YES' when:
(1) The PSD issues are resolved concerning 500 MHz UWB bandwidth,
(2) Coexistence is addressed by a common signaling mode,
(3) A simple accurate and effective mechanism for distance measurement is addressed,
(4) A solution for energy sensitive devices is shown.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **129**

Welborn, Matt Motorola, Inc.

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

There were "no" comments in July that the MB-OFDM solution uses dummy tones in order to meet the 500 MHz minimum bandwidth requirement. The name of the tones was changed to guard tones as an attempt to satisfy the no vote comments. This does not change the fact that they are unneeded. 5 of the 6 guard tone groups for mode 1 impact restricted bands. The NTIA says that any device that purposely injects noise into the spectrum in order to meet the FCC minimum bandwidth requirements for UWB should never be certified.

SuggestedRemedy

I will consider changing my no vote to yes if the guard tomes are eliminated from the proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **4**

Adams, Jon — Motorola, Inc.

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

I don't see any products anytime soon from the MBOA. Time to market is an important part of selection. The DS camp has second generation silicon and third generation coming later this year. It has a strong data rate growth path that has been demonstrated in multiple presentations. The only things the MBOA has shown as physical devices are rack-mounted transmit-only devices that are largely composed of discrete devices and that do not meet the MBOA proposal. Please show real silicon solutions that meet the proposal and validate all of the hypotheses.

SuggestedRemedy

I may be able to change my NO vote when sufficient answers to the above issues are adequately addressed.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **17**

Dydyk, Michael — Consultant

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

I do not believe that Proposal #1 will be able to deliver samples of their design in 2004. As an Analog Designer of MMIC functions at Microwave frequencies who knows the duration of process steps I predict, late 2005.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **24**

Emami, Shariar — Motorola, Inc.

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

Time to market issue is a primary concern for MBOA.

SuggestedRemedy

Will consider changing my vote if it is addressed realistically.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **47**

Heberling, Allen — Motorola, Inc.

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

Time To Market: I voted NO on the MB-OFDM proposal because the advocates for this proposal have yet to provide demonstrable chip level technology. Power point slides and simulations are insufficient evidence for adopting a proposal. The DS-UWB proposal advocates have provided demonstrable chip level implementations of their proposal.

SuggestedRemedy

Consequently, I will consider changing my NO vote to a YES if the MB-OFDM advocates can provide a demonstrable chip implementation.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **60**

Hoghooghi, Michael M. — Motorola, Inc.

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

TTM & Availability I voted NO on the MB-OFDM proposal because the promoters of the MB-OFDM proposal have yet to provide demonstrable chip level technology. Power point slides and simulations are insufficient evidence for adopting a proposal.

SuggestedRemedy

Consequently, I will consider changing my NO vote to a YES if the MB-OFDM advocates can provide a demonstrable chip implementation.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **160**

Lampe, John — Nanotron Technologie

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

The MBOA proposal does not have an acceptable time to market. Technology that can be economically built in volume soon is required.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **150**

Mc Laughlin, Michael decaWave LLC

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

Time to market is comparatively worse than other proposals

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **78**

Odman, Knut Motorola, Inc.

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

Time to market I see implementation time to market as a crucial parameter for a successful 802.15.3 alternate Phy. The DS-CDMA camp has second generation silicon on the market while the MB-OFDM yet has to show a successful implementation.

SuggestedRemedy

I will consider changing my vote to yes once the MB-OFDM camp releases silicon of comparable maturity to DS-CDMA.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **85**

Poor, Robert Ember Corporation

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

my primary reason for a "no" vote is time to market. recall that the original 802.11 had several phys. if ieee had waited for a single unified phy, other standards may have overtaken 802.11. motorola has in hand a working solution. taking it to market quickly to establish the "sg3a franchise" will do more to make the standard a success than anything else. delays will only weaken any ieee standard that emerge.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **127**
Seals, Michael — Conexant Systems

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

and the time required for synchronization to a FH PHY.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **88**
Fisher, Chris — XtremeSpectrum, Inc.

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

In addition to these reasons I would include the comments/reasons from Matt Welborn and John McCorkle.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **8**
Gifford, Ian — XtremeSpectrum, Inc.

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

"Ditto" to John Barr, plus:

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **10**
Gifford, Ian — XtremeSpectrum, Inc.

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

Also, I agree with ALL the other NO voter comments on record and provided in this timeslot via e-mail and/or via a verbal delivery from the floor.

SuggestedRemedy

I'LL CONSIDER CHANGING MY NO TO A YES IF THESE ADDITIONAL CONCERNS ARE ADDRESSED IN WRITING (VIA A CONTRIBUTION TO 802.15.3a).

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **49**
McCorkle, John — XtremeSpectrum, Inc.

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

I incorporate by reference all other no-voter comments, all of which must be resolved before I will change my vote to a yes.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **95**
Rasor, Gregg — Motorola, Inc.

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

I will consider changing my NO vote to a YES if the following considerations are fully satisfied:
- Incorporate by reference all comments set forth by ALL No voters, particularly those articulated by Matt Wellborn, John Barr, and Alan Heberling.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **150**
Wilson, Richard — Independent

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

I agree with Matt Welborn as to reasons for my NO vote.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **53**

McInnis, Michael — The Boeing Company

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

This proposal does not afford the user the ability to select and use bands individually. Rather than using Band A, perhaps a user would rather use Band B, or Band C, or Band D.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **71**

Odman, Knut — XtremeSpectrum, Inc.

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

The CE groups requirements in 03/276r0 is not met or at the best met only poorly. For instance the CE group wants support for up to 8 simultaneous piconets.

SuggestedRemedy

I will consider changing my vote to Yes when the MB/OFDM proponents have demonstrated that all requirements in 03/276r0 are met.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **118**

Allen, Jim — Appairent Technologie

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

I would also prefer we take a "none of the above" straw poll to see if there is support for the two camps to go back to the Siep meetings and bring us a single proposal. This, however does not address the question on the floor.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **85**

Dydyk, Michael — Consultant

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

I have seen and heard a great deal of information about both proposals however, I must say that I do not have a warm feeling as to how valid the information is. Consequently, I would like to see an Offical Task Group activity to evaluate the two proposals. It has to be a joint effort that would be above approach.

SuggestedRemedy

If such a Team is put together and the Team makes a recommendation as to which proposal is better, I will vote for that proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **41**

Kinney, Pat — Kinney Consulting LLC

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

My no vote results from the lack of cooperation between the two proposers.

SuggestedRemedy

I would change my vote to a yes if both sides would agree to a single compromised proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **55**

McInnis, Michael — The Boeing Company

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

All simulation assumptions presented in the M-OFDM proposal of M-OFDM and DSSS MBOK system performance are questionable and cannot be relied upon as being accurate until both the M-OFDM Alliance and Motorola work together to achieve common comparison parameters and assumptions between the two proposals.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **94**

Pardee, Jack innov8rs, LLC

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

The most recent merged proposal #1 presentation made several comparisons to an earlier version of the merged proposal #2 than that on which the selection vote was based. Concerns expressed by Michael McLaughlin and others about inaccurate characterizations of merged proposal #2 have not been reasonably addressed.

SuggestedRemedy

I would consider changing my No vote to a Yes after hearing presentations and Q&A sessions on both merged proposals representing their current level of development and when the two merged proposals have been fairly compared based on the most current revs of the supporting documents and when the authors of each proposal agree that the other proposal team is using a fair model and/or characterization of their work.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **105**

Reede, Ivan AmeriSys Inc.

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

Standards in IEEE are traditionally a joint effort of technical excellence and business compromise which leads to the formation of a consensus base. Since July 2003, I have not been satisfied by answers presented and I have not seen the results of serious consensus forming efforts between the two main proposers that would justify changing my confirmation vote from no to yes. Although the process at this point may appears to be at a standstill, I believe that progress will start when both parties really start to negotiate and compromise. It is my hope that both proposer groups realize that compromise on both sides is required. I have seen enough information to convince me to a reasonable degree that both proposals are technically feasible, to the exception of regulatory body approvals. However, I have seen enough conflicting information to cause confusion and dismay. I believe both parties have to get together and come forward to the IEEE with a joint, mutually agreed comparative report stating what both proposals have in common and then the differentiating items (with comparative results). For many reasons, I am convinced by the nature of the current situation that each party would make sure that what would be reported is factual. History within IEEE has shown that quality standards are born from compromise within technical excellence.

SuggestedRemedy

I would consider changing my confirmation vote from NO to YES if the points I raised in the July NO vote support document are addressed and if a reasonable consensus position is achieved within the 802.15.3a committee.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **144**

Wang, Jing JWA Consulting, LLP

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

Procedural wise, today's down-selection is unfair for the CP2 team. CP2 was based on a version prepared within 90 mins in SIN, and its add-on's worked out after SIN did not even get a chance to present formally in front of the TG. (Although the doc was on the server, and most voters were unable to access and digest the doc before the row-call vote while the server was down.) Needless to say, the CP1 team has done a lot of work after SIN (the comparisons of both proposals on RF design, ADC, digital complexity, etc).

SuggestedRemedy

I will change my vote from NO to YES only after I heard from CP2 teams response to these comparisons for which CP1 team claims its proposal is superior.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **146**

Wang, Jing JWA Consulting, LLP

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

I agree with Pat Kinney on a further combined proposal from both camps.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **80**

Chang, Soo-Young University of California,

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

More detailed performance analysis needed. Time to market. Interference. Complexity.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **12**

Gilb, James — Appairent Technologie

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

The proposal has not provided a proper RF/analog analysis of the proposed frequency generation system, which is key to the implementation of this proposal. Based on a quick analysis, the specifications necessary to implement this architecture would result in higher costs due to the low yeilds of the RF section. If this is true, then the proposal will not be able to meet the goals of low cost, low complexity.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **35**

Hoghooghi, Michael M. — Motorola, Inc.

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

Substantiated proof that the analog RF sections are realizable and less complex than those seen in 802.11a IC's.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **59**

Mc Laughlin, Michael — decaWave LLC

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

I voted no because the MB-OFDM proposal has poor scalability for low cost implementations.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **57**

Mc Laughlin, Michael — decaWave LLC

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

I voted no because the MB-OFDM proposal's range is lower, complexity is higher than the DS alternative.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **56**

McInnis, Michael — The Boeing Company

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

This M-OFDM proposal relies too heavily on the development of future CMOS chip technology (year 2005 or beyond) for expansion into the Group B (4.9 to 6.0 GHz), Group C (6.0 to 8.1 GHz), and Group D (8.1 to 10.6 GHz) bands. This future CMOS technology may not arrive as soon as the proposers have predicted and there is no guarentee that new CMOS technology will work in the Group B, C, and D bands efficiently enough to expand this proposal into the higher bands as proposed in the near future.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE OFDM PROPOSAL CAN PROVE UNEQUIVOCALLY THAT THE PROPOSAL IS COMPLIANT TO THE FCC REGS AS IT IS CURRENTLY PROPOSED, DOES NOT SUFFER A PERFORMANCE DETRIMENT RELATIVE TO WHAT HAS BEEN PROPOSED AS A RESULT OF THE FCC RULES, THE M-OFDM PHY PROPOSAL IS SHOWN, NOT SIMULATED, TO PROVIDE LESS INTERFERENCE TO LICENSED SATELLITE SERVICES OPERATING WITHIN THE UWB BAND THAN THE MOTOROLA PROPOSAL DOES, THE ABILITY TO SELECT AND USE THE GROUP A, B, C, AND D BANDS INDIVIDUALLY IS PROVIDED IN THE PROPOSAL, AND The MB-OFDM PROVIDES THE ABILITY TO MODIFY ITS TRANSMIT SPECTRUM TO DYNAMICALLY TURN ON OR OFF TONES TO PROVIDE BAND COEXISTENCE WITH OTHER LICENSED WIRELESS SERVICES OPERATING IN THE UWB BAND.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **103**

Rasor, Gregg — Motorola, Inc.

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

Substantiated proof that the analog RF sections are realizable and less complex than those seen in 802.11a IC's.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **2**

Gandolfo, Pierre — XtremeSpectrum, Inc.

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

Bit shuffling for coexistence can be used with OFDM but requires involved handshaking. How handshaking between Tx and Rx to reorder sub-carrier bit loading is implemented in the case of narrowband interference is still unknown at this point.

SuggestedRemedy

I will consider changing my NO vote to a YES vote if details are provided on how this dynamic spectral shaping by turning off or on tones & bands can be accomplished in an effective way that does not impact the system performance or ability to support multiple piconets.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **100**

Rasor, Gregg — Motorola, Inc.

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

Complete disclosure of interference testing results, including the simulation and TESTING of MBOA prototypes for in- and out- of band effects on co-located cellular telephone systems such as GSM, CDMA, and WCDMA.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **99**

Rasor, Gregg — Motorola, Inc.

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

Proven levels of radiated and conducted emissions not only per the FCC rules, but sufficiently low to permit co-integration of the resulting devices in units mentioned above.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **98**

Rasor, Gregg — Motorola, Inc.

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

Demonstration of co-location capability with portable electronic devices such as cell phones, portable MP3 players, etc. This has not been addressed at all.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **32**

Hoghooghi, Michael M. — Motorola, Inc.

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

Demonstration of digital / RF CMOS in generally available FAB (TI, Intel, TSMC, ST Micro) with sufficient performance to implement 15.3 radios yielding at 6-sigma levels. Specifically, 130nM and 90nM RF & digital CMOS.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **30**

Hoghooghi, Michael M. Motorola, Inc.

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

Demonstration of a working prototype that implements effective protection (deleted tones, etc.) for specific licensed services and reserved bands without degrading information throughput to a level less than 95% of the expected maximum for the selected operating mode.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **97**

Rasor, Gregg Motorola, Inc.

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

Demonstration of a working prototype that implements effective protection (deleted tones, etc.) for specific licensed services and reserved bands without degrading information throughput to a level less than 95% of the expected maximum for the selected operating mode.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **139**

van Leeuwen, Hans Smart Telecom Solutio

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

The interference demo is a strong indication that DS-CDMA approach is inherently meeting the coexistence targets with licensed services. The MBOA group has not shown a real demonstration and relies only on models and analysis of theoretical victims.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **18**

Grohmann, Bernd Danfoss A/S

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

My impression is that the standardization of MB-OFDM is rushed too much and that especially the selection of MB-OFDM over DS-CDMA is premature. There has not been sufficient time to properly review and discuss both alternatives.

SuggestedRemedy

I will consider to change my vote to YES if all those concerns are fully resolved.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **104**

Rasor, Gregg Motorola, Inc.

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

I will vote YES if the UWB PHY is selected from at least two options, that is the MAC is modified to negotiate which PHY is operational, e.g., the MBOA proposal and the DS-CDMA proposal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **114**

Alfvin, Rick Appairent Technologie

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

I voted no on confirmation because I am not satisfied that the Merger #1 proposal can achieve FCC compliance.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **115**

Allen, Jim — Appairent Technologie

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

"Ditto" to the reasons given by Rick Alfvin. The issue of FCC acceptability of the Merged Proposal #1 has not been demonstrated.

SuggestedRemedy

I would consider changing my No vote to Yes when this key issue has been addressed with acceptable rigor.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **75**

Ballentine, Paul — Motorola, Inc.

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

The IEEE should adopt a standard that not only passes FCC regulations but passes international regulations as well. MPHPT, CEPT, and ITU are major concerns. The MBOA is shown to cause more interference than best available technology. The problem is in-band wideband victim receivers. These are often passive and can not be sensed, so dynamic control of emission spectrum is not always feasible. UWB will be around for a long time. There are already many in-band victims, and there is likely to be many more in the future. The MB-OFDM approach does not address these concerns.

SuggestedRemedy

I will vote yes when these concerns are met.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **76**

Barr, John — Motorola, Inc.

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

The compliance of the MB-OFDM waveform is in question under the FCC's existing UWB rules due to the clear requirement that frequency-hopping systems be stopped during measurement. Furthermore, analysis has shown that the MB-OFDM proposal causes more interference to existing systems than the DS-CDMA proposal, and that it causes as much interference as similar UWB waveforms prohibited by the FCC in the Report and Order. A document showing how this interference was measured for one of the many victim receivers licensed to use the spectrum proposed for UWB systems has been submitted to document this interference and the reasons why the MB-OFDM waveform does not conform to current rules. In addition, the performance claims of the MB-OFDM proposal are based on the use of a 3X power signal due to the inappropriate interpretation of the FCC rules.

SuggestedRemedy

I will consider changing my NO vote to yes if the task group accepts a waveform that does not cause any more interference for one or more victim receivers than the DS-CDMA proposal, and provides better performance than the DS-CDMA proposal using the non-interfering waveform.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **77**

Blaney, Tim — Commcepts

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

Under the current UWB rules from the FCC, the compliance of the MB-OFDM waveform is in question because of the requirement that frequency-hopping systems be stopped during measurement. Also, there has been technical information presented that shows that the MB-OFDM proposal can cause more interference to existing systems than the DS-CDMA proposal.

SuggestedRemedy

I will consider changing my NO vote to a YES if the task group can provide written clarification from the FCC that the MB-OFDM proposal would be legal under the existing rules and show that the interference generated by the acceptance of the MB-OFDM proposal will not cause degradation to other existing systems in the proposed band of operation.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **78**

Bourgeois, Monique — Motorola, Inc.

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

The compliance of the MB-OFDM waveform is in question under the FCC's existing UWB rules due to the clear requirement that frequency-hopping systems be stopped during measurement. Furthermore, analysis has shown that the MB-OFDM proposal causes more interference to existing systems than the DS-CDMA proposal, and that it causes as much interference as similar UWB waveforms prohibited by the FCC in the Report and Order.

SuggestedRemedy

I will consider changing my NO vote to a YES if the FCC provides written clarification that the MB-OFDM proposal would be legal under the existing rules. This clarification must take the form of a rule change, a written formal rule interpretation from the FCC, or a direct letter from the FCC.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **79**

Callaway, Ed — Motorola, Inc.

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

My reason for voting "no" on the latest TG3a confidence vote is that I do not believe the selected proposal will survive a serious evaluation against the FCC interference rules without a significant reduction of transmit power, which would reduce range to the point that the target market would be unserved.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **83**

Choi, Yun Hwa — Samsung

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

FCC regulation issue about interference. MB-OFDM simulations still have not satisfied for their interference problems for me.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **87**

Fisher, Chris — XtremeSpectrum, Inc.

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

MP#1 has failed to definitively prove that they do not have an FCC Certification, not compliance, issue. I require that they obtain an official FCC written statement that their system as defined in the MP#2 is certifiable under the current FCC Report and Order.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **89**

Fisher, Reed — Oki Electric Industry C

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

I will consider changing my No to a Yes if the modified OFDM proposal can prove that the proposal is compliant to the FFC regulations and does not suffer a performance detriment relative to non-FH proposals as a result of the FCC rules. An example would be to have a working prototype that obtains FCC approval under Part 15.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **90**

Gandolfo, Pierre XtremeSpectrum, Inc.

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

I will consider changing my NO vote to a YES if the following concerns are resolved:
The link budget calculations, as described in doc #03268r2, with a 0dB spectral backoff (i.e. flat spectrum), seem overly optimistic to me. Merger proposal N1 is a FH system, with a very fast hopping rate, and, as such, will exhibit additional spectral components due to the periodic hopping pattern (same hopping sequence used within a superframe regardless of the Rotational Sequence being used by one specific piconet). Moreover, the spectral line spacing for this comb of spectral lines, caused by the periodic hopping sequence is directly proportional to the hopping sequence duration (936ns or 1MHz frequency interspace) and the magnitude of those spectral lines follow a sinc envelope that is function of the dwell time (328ns). That is, the shorter the dwell time, the slower the hopping pattern spectral lines decay with respect to frequency. As such, this comb of spectral lines, when taken into account, will create some ripple effect, thus giving rise to a transmit power backoff in order to remain compliant with the FCC limit. The test results presented by TDK in Singapore last September seem to confirm those assumptions (slides 55 & 56 of doc 03449r0).

SuggestedRemedy

As such, these additional spectral components and their impact on the output spectrum of a MBOA system, shall be carefully determined and taken into account into the link budget analysis in order to change my No vote to a Yes.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **91**

Gandolfo, Pierre XtremeSpectrum, Inc.

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

My concerns regarding the FCC regulatory issue for MBOA systems, from the San Francisco meeting, last July, have not been resolved. Within the bandwidth of a victim receiver, a MBOA system is identical to a gated UWB system, “where the transmitter is quiescent for intervals that are long compared to the pulse repetition interval”. Such systems are currently prohibited under the current rules unless they reduce their transmit power, thereby significantly impacting performance. Furthermore, further analysis has shown that that FH-UWB leads to interference levels that exceed those anticipated by FCC in R&O. Given this incertitude and the very likely WW regulatory deadlock (ITU, CEPT, New FCC NPRM) that will result from it and the impossibility to ship products (i.e. dead standard),

SuggestedRemedy

I will consider changing my No vote to a yes if the MBOA alliance provides written proof from the FCC that their system is indeed complaint under the current rules.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **9**

Gifford, Ian XtremeSpectrum, Inc.

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

FCC. The compliance of the MB-OFDM waveform is in question under the FCC's existing UWB rules due to the clear requirement that frequency-hopping systems be stopped during measurement. Furthermore, analysis has shown that the MB-OFDM proposal causes more interference to existing systems than the DS-CDMA proposal, and that it causes as much interference as similar UWB waveforms prohibited by the FCC in the Report and Order. A document showing how this interference was measured for one of the many victim receivers licensed to use the spectrum proposed for UWB systems has been submitted to document this interference and the reasons why the MB-OFDM waveform does not conform to current rules. In addition, the performance claims of the MB-OFDM proposal are based on the use of a 3X power signal due to the inappropriate interpretation of the FCC rules.

SuggestedRemedy

I will consider changing my NO vote to yes if the task group accepts a waveform that does not cause any more interference for one or more victim receivers than the DS-CDMA proposal, and provides better performance than the DS-CDMA proposal using the non-interfering waveform. ALSO THAT THE OFDM PROPOSAL CAN PROVE UNEQUIVOCALLY THAT THE PROPOSAL IS COMPLIANT TO THE FCC REGS AS IT IS CURRENTLY PROPOSED, DOES NOT SUFFER A PERFORMANCE DETRIMENT RELATIVE TO WHAT HAS BEEN PROPOSED AS A RESULT OF THE FCC RULES.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **11**

Gilb, James Appairent Technologie

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

The proposal still has not addressed FCC compliance at proposed power levels with the proposed modulation format.

SuggestedRemedy

Only FCC certification of a device that uses the proposed modulation at the proposed power level would address the concern.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **13**

Godfrey, Tim — Conexant Systems

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

The MB-OFDM proposal has not demonstrated that the modulation will meet FCC requirements. There are unanswered questions with respect to the potential for interference with licensed users of the spectrum.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **15**

Gorday, Paul — Motorola, Inc.

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

According to my understanding of the FCC UWB rules, the current MB-OFDM proposal is not compliant. Furthermore, convincing simulations and analysis have been put forward that show the MB-OFDM proposal does cause higher levels of interference that what was anticipated by the FCC rules.

SuggestedRemedy

In order to change my no vote to a yes, the MB-OFDM proposal would either need to produce stronger evidence that the FCC is willing to change the current rules, or the MB-OFDM proposers would need to modify their signal format such that there is no transmit power penalty associated with meeting current FCC rules.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **16**

Grohmann, Bernd — Danfoss A/S

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

The compliance of MB-OFDM under the FCC's existing UWB rules is not sufficiently clear to justify the confirmation of it's selection over DS-CDMA at this time.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **19**

Heberling, Allen — XtremeSpectrum, Inc.

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

FCC - My primary reason for voting NO on the MB-OFDM proposal is that the advocates for this proposal have failed, yet again, to address my concerns from the July IEEE Plenary meeting in San Francisco regarding the FCC regulatory issue.

SuggestedRemedy

Consequently, I will consider changing my NO vote to a YES vote if the MB-OFDM coalition provides written proof from the FCC that their(MB-OFDM) proposal is COMPLIANT under current FCC UWB rules. The form of this written proof may take the form of a rule change, a written formal rule interpretation from the FCC, or a direct letter from the FCC.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **23**

Herold, Barry — Motorola, Inc.

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

FCC. Interference.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **24**

Heubaum, Karl — Motorola, Inc.

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

The compliance of the MB-OFDM proposal with the FCC's UWB report and order is still in question. Analysis and real world experimental evidence indicate the MB-OFDM proposal will cause more interference to existing victim receivers than the DS-CDMA proposal, and will cause as much interference as similar gated UWB systems that are specifically prohibited in the FCC's report and order.

SuggestedRemedy

I will consider changing my no vote to yes if the FCC provides written clarification -- a rule change, a written formal rule interpretation, or a letter directly from the FCC -- indicating that the MB-OFDM proposal complies with its UWB regulations.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **27**

Hoghooghi, Michael M. Motorola, Inc.

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

Here is a list of some specific reasons for my vote of NO on the confirmation vote and I may consider changing my NO vote to a YES if the following considerations are fully satisfied:
1. Complete disclosure of interference testing results, including the simulation and TESTING of MBOA prototypes for in- and out- of band effects on co-located cellular telephone systems such as: FSS, GSM, CDMA, and WCDMA. Furthermore, analysis has shown that the MB-OFDM proposal causes more interference to existing systems than the DS-CDMA proposal, and that it causes as much interference as similar UWB waveforms prohibited by the FCC in the Report and Order. A document showing how this interference was measured for one of the many victim receivers licensed to use the spectrum proposed for UWB systems has been submitted to document this interference and the reasons why the MB-OFDM waveform does not conform to current rules. In addition, the performance claims of the MB-OFDM proposal are based on the use of a 3X power signal due to the inappropriate interpretation of the FCC rules.

SuggestedRemedy

This clarification must take the form of a rule change, a written formal rule interpretation from the FCC, or a direct letter from the FCC.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **36**

Hoghooghi, Michael M. Motorola, Inc.

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

The full disclosure of implementation details on alleged MBOA prototypes fabricated according to the current MBOA proposal, and COMPLETE FCC testing results, along with a matrix of these devices operating in the presence of in-band victim receivers such as analog and digital C-band TVRO systems.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **33**

Hoghooghi, Michael M. Motorola, Inc.

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

Proven levels of radiated and conducted emissions not only per the FCC rules, but sufficiently low to permit co-integration of the resulting devices in units mentioned above. The compliance of the MB-OFDM waveform is in SERIOUS question under existing UWB rules from FCC due to the clear requirement that frequency-hopping systems be stopped during measurement.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **42**

Kohno, Ryuji CRL

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

Since the beginning of our CRL own proposal before merged, I have been emphasizing importance of satisfying regional regulations as well as FCC's one because spectral allocation is different in each a country or a region. In fact, in Japan interference to other coexisting systems as well as the IEEE802.11a in the same band should be avoided. So, in the MB-OFDM proposal analysis of interference to these coexisting systems has not been analyzed good enough yet and no clear strategy to overcome this issue has been described yet.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **45**

Kraemer, Bruce Conexant Systems

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

The FCC has made it clear that MB-OFDM cannot increase the level of interference above that previously allowed under the rules adopted for UWB waveforms. Presentations provided so far, have not made clear that the proposed MB-OFDM complies with the FCC's rules and subsequent guidance.

SuggestedRemedy

A yes vote is conditional on having adequate evidence of compliance at least to the FCC emissions mask and hopefully, evidence of broad international regulatory acceptance.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **47**

Martin, Frederick Motorola

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

I am still not satisfied that the OFDM proposal is compliant under FCC rules. I would like to see clarification by the FCC on this point. Comments by the FCC prior to Singapore seemed did not seem to me to be an acknowledgement that the OFDM scheme meets current rules or that rules would be modified to accommodate it.

SuggestedRemedy

I would consider changing my NO vote if this issue is addressed.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **50**

McInnis, Michael The Boeing Company

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

My "NO" reasons and comments for Round 2 M-OFDM confirmation voting are as follows:
M-OFDM compliance with FCC UWB rules of is still in question and my confirmation "no-vote" during the July meeting was not adequately answered or responded to sufficiently enough during the September and November meetings to convince me that I should switch my vote to a yes on this issue. Motorola has made a statement that waveforms which are similar to the proposed M-OFDM PHY have been prohibited by the FCC in their Report and Order. The M-OFDM UWB rule compliance issue needs to be clarified in the form of an FCC UWB rule change, a written formal UWB rule interpretation of the M-OFDM PHY from the FCC, or a direct letter from the FCC to IEEE 802 that the proposed M-OFDM PHY complies with FCC UWB rules as written. Is this M-OFDM UWB PHY proposal going to be received at the FCC in the same manner as OFDM was when it was first proposed for WLANs?
http://www.ce-mag.com/archive/02/Spring/cokenias.html
In May 2001, FCC issued a Further Notice of Proposed Rulemaking and Order (FNPRM) to change the current unlicensed spread-spectrum radio requirements in Part 15.1 This notice is further to one requested by 13 petitioners for revising parts of the rules governing frequency-hopping spread-spectrum devices. The second notice was released primarily as a result of actions taken on a certification application from Wi-Lan Inc. (Calgary, AB, Canada). Wi-Lan submitted a certification application for a 2.4 GHz device using wideband OFDM. In its petition, Wi-Lan argued that its device met the technical requirements for a spread-spectrum device. FCC did not agree, but saw merit in making provisions in the rules for alternative digital-modulation technologies. Rather than create a separate rule section, FCC elected to include provisions for digital transmission systems by amending the existing spread-spectrum rules. The proposed changes would amend a number of rule sections in Section 15.247 to include the terms digitally modulated and digital modulation techniques in addition to the direct sequence and frequency hopping terms already in use.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **54**

McInnis, Michael The Boeing Company

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

All link budget assumptions in the M-OFDM proposal are questionable and cannot be relied upon as being accurate until the FCC comments on whether the power levels presented to us in this proposal are allowed by current FCC UWB rules.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **65**

Morelli, Anthony Conexant Systems

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

Still too much uncertainty over regulatory issues.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **67**

Naeve, Marco Eaton Corporation

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

Also I feel that the DS-CDMA approach will cause less interference to the coexisting licensed services. The M-OFDM group has not shown any real demonstrations but instead relies on models analysis of theoretical victims.

SuggestedRemedy

I will consider changing my vote to yes if the group proposing the M-OFDM solution provides a written proof from the FCC that their proposal is compliant under the current FCC UWB rules. I accept the written proof as suggested by Allen Heberling's no-vote response. In addition I would like to see a clear demonstration that the interference levels of the M-OFDM proposal are similar to the once of the DS-CDMA proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **66**

Naeve, Marco — Eaton Corporation

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

Reason for no vote: I concur with the previous no-voters concerns. I don't think that the multiband OFDM proposal has sufficiently shown yet how compliance to the FCC UWB regulations can be achieved, due to the fact that frequency-hopping systems need to be stopped during measurement. The reason from my no vote during the July meeting has not been sufficiently address.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **68**

Odman, Knut — XtremeSpectrum, Inc.

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

Unclear issues regarding FCC compliance for frequency hopping UWB. A ruling by FCC that MB/OFDM will be in compliance with their UWB rules is required.

SuggestedRemedy

I will consider changing my vote to Yes if the FCC rules that MB/OFMD is compliant with FCC UWB.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **92**

Ogawa, Hiroyo — NICT aka CRL

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

I will consider changing my No to a Yes if the modified OFDM proposal can prove that the proposal is compliant to the FFC regulations and does not suffer a performance detriment relative to non-FH proposals as a result of the FCC rules. An example would be to have a working prototype that obtains FCC approval under Part 15.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **93**

Pardee, Jack — innov8rs, LLC

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

The issue of FCC acceptability of the Merged Proposal #1 has not been demonstrated.

SuggestedRemedy

I would consider changing my No vote to Yes when this key issue has been addressed with acceptable rigor.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **101**

Rasor, Gregg — Motorola, Inc.

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

The full disclosure of implementation details on alleged MBOA prototypes fabricated according to the current MBOA proposal, and COMPLETE FCC testing results, along with a matrix of these devices operating in the presence of in-band victim receivers such as analog and digital C-band TVRO systems.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **106**

Rofheart, Martin — XtremeSpectrum, Inc.

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

I will consider switching my NO vote to a yes if:
A waveform that is not more interfering that then FCC and other spectrum stakeholders expected is selected.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **108**

Rypinski, Chandos — Individual

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

Regulatory uncertainties.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **122**

Sarallo, John — Appairent Technologie

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

I am worried that the current proposal will not get FCC approval at the specified power levels. Even with the extra power, the DSSS proposal achieves similar distance. Without the extra power, the MBOA proposal's range will be compromised.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **125**

Seals, Michael — Conexant Systems

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

Among several reasons for my voting no, I am concerned about the ability of transmitters using the MBOFDM waveform to pass FCC certification, the waste of energy on 'user defined tones' that are there just to satisfy FCC rules, and the time required for synchronization to a FH PHY.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **128**

Shiraki, Yuichi — Oki

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

I will consider changing my No to a Yes if the modified OFDM proposal can prove that the proposal is compliant to the FFC regulations and does not suffer a performance detriment relative to non-FH proposals as a result of the FCC rules. An example would be to have a working prototype that obtains FCC approval under Part 15.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **129**

Shvodian, Bill — XtremeSpectrum, Inc.

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

I have the same reasons for my no vote as Matt Welborn and John McCorkle. Here is a list of some specific reasons for my vote of NO on the confirmation vote:
The compliance of the MB-OFDM waveform is in question under the FCC's existing UWB rules due to the clear requirement that frequency-hopping systems be stopped during measurement. Furthermore, analysis has shown that the MB-OFDM proposal causes more interference to existing systems than the DS-CDMA proposal, and that it causes as much interference as similar UWB waveforms prohibited by the FCC in the Report and Order.

SuggestedRemedy

I will consider change my NO vote to a YES if the FCC provides written clarification that the MB-OFDM proposal would be legal under the existing rules. This clarification must take the form of a rule change, a written formal rule interpretation from the FCC, or a direct letter from the FCC.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **133**

Takizawa, Kenichi — CRL

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

The reasons of my NO vote include the following concerns. I think that the MBOA proposal is not compliant to the FFC regulations.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **138**

Tokuda, Kiyohito Oki

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

I will consider changing my No to a Yes vote if the modified OFDM proposal can prove that the proposal is compliant to the FFC regulations and does not suffer a performance reduction compared to non-FH proposals as a result of the FCC rules. An example would be to have a working prototype that obtains FCC approval under Part 15.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **147**

Welborn, Matt XtremeSpectrum, Inc.

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

The compliance of the MB-OFDM waveform is in question under the FCC's existing UWB rules due to the clear requirement that frequency-hopping systems be stopped during measurement. Furthermore, analysis has shown that the MB-OFDM proposal causes more interference to existing systems than the DS-CDMA proposal, and that it causes as much interference as similar UWB waveforms prohibited by the FCC in the Report and Order.

SuggestedRemedy

I will consider change my NO vote to a YES if the FCC provides written clarification that the MB-OFDM proposal would be legal under the existing rules. This clarification must take the form of a rule change, a written formal rule interpretation from the FCC, or a direct letter from the FCC.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **153**

Zhang, Honggang CRL

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

If multi-band OFDM systems turn off more tones & bands, then serious problems would inevitably happen, namely: [1] capacity and performance (e.g. data rate, BER) degradation due to some sub-carriers turned off; [2] if more sub-carriers are lost, multi-band OFDM proposal will no longer meet the ultra wideband definition of FCC (>500 MHz); [3] turning off more sub-carriers would cause more implementation burdens and be against regulatory compliance from country to country.

SuggestedRemedy

I will consider change my “NO” vote to a “YES” vote if a suitable solution and its details are provided on how the spectral shaping of multi-band OFDM proposal by turning off or on tones & bands can be accomplished in an effective way that does not deteriorate the system performance and support smooth regulatory compliance around the world.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **154**

Zyren, Jim — Conexant Systems

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

The reason for my "no" vote relates to regulatory matters. My understanding of current FCC rules leads me to conclude that the MBOA proposal does not comply with FCC rules. That said, I am open to discussion on this matter. I would prefer to try to have a conversation between the FCC and IEEE 802.15.3a on this point. Barring that, agenda time to discuss this matter in detail would be helpful. Aside from FCC concerns, possible regulatory conflicts in Europe have arisen. I would like to hear MBOA's comments on a story that recently appeared in EE TImes on this point:
<http://www.commsdesign.com/news/OEG20031110S0085>
802.18 is currently evaluating UWB impact on 802.11. This is a positive development because we will now hear the perspective from the potential victim technology. This begs the question: What will the FCC do if 802.11 companies visit the FCC representing views that are in opposition to those expressed by 802.15 companies? We already know that the FCC is concerned about the fact that the MBOA proposal is avoiding emissions in the 5 GHz 802.11a bands. Recent comments appearing in the press regarding regulatory obstacles in Europe heighten this concern. We will be asking the FCC to create rules that accommodate the 802.15.3a solution. They are already considering elimination of the 500 MHz minimum channel width restriction. In my opinion, they are likely to do so. At the same time, there are two interpretations of the FCC rules in play:
A) XSI interpretation: less bandwidth means transmitting less power (constant PSD model)
B) MBOA interpretation: less bandwidth does not require transmitting less power (constant AVERAGE power model) Elimination of the 500 MHz minimum channel width requirement in conjunction with the MBOA interpretation, leads to some scenarios that are cause for concern:
1.) Divide UWB spectrum into 100 sub-channels (76 MHz each)
2.) Under MBOA interpretation, allowable instantaneous PSD in the occupied channel is -21 dBM/MHz
3.) This PSD would result in a total emitted power of -2 dBm in 76 MHz channel. This would result in a fast frequency hopper at near-Bluetooth power levels operating from 3.1 to 10.6 GHz (impacting all users)
4.) The instantaneous power in a 20 MHz 802.11a channel would be -8 dBm. With a 3 MHz hop rate (much less than the passband of an 802.11a receiver), an 802.11a receiver would experience interference commensurate with the peak power (-8 dBM) rather than the average power (see FCC comments in first R&O). For all of these reasons, I am concerned that the MBOA proposal would face serious opposition at the FCC and other regulatory bodies.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **117**

Allen, Jim — Appairent Technologie

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

There are also assumptions made in the proposal about SOPs and the spectra of proposal one that will be practically limited by the FFT transforms and the usefulness of OFDM at higher rates (400 Mbps and above to a 1GHz). Those assumptions, I believe, are not dealt with fairly yet.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **3**

Gandolfo, Pierre — XtremeSpectrum, Inc.

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

Large change in antenna aperture across multiple sub-bands, especially for mode 2 devices and more specifically mode x devices (up to 14 sub-bands), will lead to unequal SNR in each band.

SuggestedRemedy

This effect will lead to degradation in the performance of FEC and will have to be further analyzed in order to change my No vote to a yes.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **29**

Hoghooghi, Michael M. — Motorola, Inc.

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

Demonstration of a working prototype that implements effective protection (deleted tones, etc.) for specific licensed services and reserved bands without degrading information throughput to a level less than 95% of the expected maximum for the selected operating mode.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **111**

Adams, Jon — Motorola, Inc.

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

I have at least three strong reasons for my no vote. First, I have been involved in interference testing between OFDM and DS-CDMA systems for several weeks now. These are real tests, not analysis, and I have become more and more convinced that it would be negligent for the IEEE to approve a technique like OFDM that is inhearently more interfering and less "ideal" than the DS-CDMA approach. The interference demo that I have brought with me and set up in my hotel room is a telling demonstration of the very real effects of a UWB system on a typical victim receiver. The NTIA White Book lists 10 pages of classes/allocations of victim receivers, and each of these classes could consist of hundreds to thousands of actual systems consisting of potentially vast numbers of individual units. It would be absolutely unforgivable for the IEEE to approve a standard which we all know is more interfering than another, especially when the performance of each system is more or less in the same ballpark. The MBOA group has not shown a real demonstration and relies only on models and analysis of theoretical victims. The live demonstration is clear, simple to replicate anywhere, and tells a straight forward, unambiguous story.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **17**

Grohmann, Bernd — Danfoss A/S

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

I'm concerned that MB-OFDM causes more interference to existing systems than the DS-CDMA proposal and that permitted transmitter power for MB-OFDM would subsequently be lower, reducing range critically for applications.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **31**

Hoghooghi, Michael M. — Motorola, Inc.

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

Demonstration of co-location capability with portable electronic devices such as cell phones, portable MP3 players, etc. This has not been addressed at all.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **60**

Mc Laughlin, Michael — decaWave LLC

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

I also voted no because the MB-OFDM proposal would cause 5-9dBs more interference than envisaged by the FCC when the UWB rules were made.

SuggestedRemedy

I would change my No vote to a Yes if these were remedied.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **48**

McCorkle, John — XtremeSpectrum, Inc.

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

Below is a list of some specific reasons for my vote of NO on the confirmation vote:
(1) World-wide regulatory bodies are in the midst of a great deal of negative UWB activity due to continuing concerns over possible interference from UWB devices, particularly in Europe. The hard work of this committee will be lost if we choose a solution that generates more interference than alternative solutions. Furthermore, analysis using APD's has been presented to this group that clearly shows that the MB-OFDM waveform generates higher power bursts over a much higher percent of time than was anticipated by the FCC. It also shows that it will generate much higher interference levels than the alternative approaches such as Direct Sequence (DS). This finding of more potential interference based on the APD is significant because the NTIA has stated that amplitude probability distribution (APD) plots are very effective at predicting interference to a broad spectrum of victim receiver types and has even recommended that it be used as the regulatory compliance test procedure. Moreover, it has been demonstrated with live measurements on both analog and digital satellite receivers that MB-OFDM is significantly more interfering that simple white noise or DS.

SuggestedRemedy

I will consider changing my NO vote to a YES if the proposal can be changed so that its performance does not depend on FCC interpreting its rules to allow high burst levels, and that the interference looks like noise.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **51**

McInnis, Michael — The Boeing Company

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

Motorola has demonstrated that the proposed M-OFDM PHY causes more interference to MPEG-1 satellite systems co-operating within the UWB band than the DS-CDMA proposal does. In my opinion it is not enough to just meet minimum FCC UWB emission limits, we must select a UWB PHY which provides the least amount of interference as possible to co-operating licensed wireless services in the UWB band.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **64**

Moore, Mark — Artimi Ltd.

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

FSS interference.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **120**

Santoff, John — PulseLINK, Inc.

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

Interference issues.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **143**

Wang, Jing — JWA Consulting, LLP

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

Agree with Ballentine and Barr's comments on CP1 team's attitude on its proposal's interference issues.

SuggestedRemedy

I will not change my vote until FCC compliance issue is clarified, especially on simultaneous operated pico-net issue.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **151**

Young, Amos — AMI Semiconductor

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

I have voted to not confirm the OFDM proposal for the following reason: I feel that there is a real potential for interference with existing wireless communication protocols. I would ask the proposers to provide information sufficient that independent members can verify their comments on interference.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **152**

Zhang, Honggang — CRL

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

Here is a list of some specific reasons for my vote of “NO” on the confirmation vote:
(1) With respect to multi-band OFDM, although it is possible to turning off a very few tones in order to protect the Radio Astronomy bands, how about the Broadcasting and Fixed satellite services with much wider bandwidths?

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **113**

Adams, Jon — Motorola, Inc.

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

Lastly, the zero-royalty IP position put forth by XSI (and subsequently supported by Motorola) is clear and absolutely unambiguous. The IP position that the MBOA proposes is not clear and I have no idea what it will cost for me or anyone else to implement an OFDM-based UWB system. I have not seen any zero-royalty letters or statements from the coalition members nor do I know if it is even practical to assume that such a blanket statement on RAND-Z is even possible from such a diverse group of companies.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **74**

Arnett, Larry — Renesas Technology

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

"Ditto" to the reasons given by Jon Adams.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **86**

Fisher, Chris — XtremeSpectrum, Inc.

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

MP#1 has failed to deliver definitive LOA's on all contributed IP. In order to vote yes I require that all mandatory mode IP contributions to MP#1 submit a RANDz LOA and all optional mode contributions to MP#1 submit RAND or RANDz LOA.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **6**

Genossar, Michael — Adimos, Inc.

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

Rand-Z - Most of the authors have not made a statement for the record of their support for RAND-Z.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **7**

Genossar, Michael — Adimos, Inc.

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

The authors of the proposal have done a bulk of technical work, outside the IEEE meetings. The results of this work, and their potential effect on the PHY proposal have not been submitted to IEEE, and have not been shared with the rest of the members of the committee.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **37**

Hoghooghi, Michael M. — Motorola, Inc.

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

Letter of assurance from the MBOA camp on their RAND-Z position with respect to their proposal. This has yet to materialize in spite of a similar disclosure from the DS-CDMA proposal from XSi and its subsequent adoption by Motorola.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **39**

Igler, Eran — Adimos, Inc.

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

Rand-Z - Most of the authors have not made a statement for the record of their support for RAND-Z.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **40**

Igler, Eran — Adimos, Inc.

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

The authors of the proposal have done a lot of technical work outside the IEEE meetings. The outcome of this work, and their potential effect on the PHY proposal have not been submitted to IEEE, and have not been shared with the rest of the members of the committee.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **46**

Lou, Hui-Ling — Marvell Semiconductor

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

Unclear patent issues relating to the MB-OFDM proposal: Which member companies have patented technologies (or technologies under patent applications) that might be incorporated into the MB-OFDM proposal. Heard of RAND-Z but have not seen any official statements from member companies.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **63**

Moore, Mark — Artimi Ltd.

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

RAND uncertainties.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **110**

Santoff, John — PulseLINK, Inc.

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

RAND-Zs not filed yet.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **141**

van Leeuwen, Hans — Smart Telecom Solutio

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

The zero-royalty IP position put forth by XSI (and subsequently supported by Motorola) is clear. The IP position that the MBOA proposes is not clear.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **142**

Virk, Bhupender — CompXs Inc.

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

I will consider changing my vote to yes if the group proposing the M-OFDM solution provides a practical proof with a credible demonstration similar to the DS-CDMA that their proposal is compliant under the current FCC UWB rules and will be applicable to meet global requirements. In addition I would like to have a clear understanding on the IP issues by all the member companies in writing that no last minute surprises will happen as we will move ahead.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **44**

Kohno, Ryuji — CRL

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

Although some of applications of WPAN assumes capability of ranging and position, the MB-OFDM proposal has not analyzed the capability comparing with the DS-CDMA proposal good enough.

SuggestedRemedy

I would consider changing my NO vote to a YES vote if these important issues have been solved as well as other No voters' requirements.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **70**

Odman, Knut — XtremeSpectrum, Inc.

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

Limited support for location awareness. CE5 required location awareness with a resolution on 30 cm on 10 m distance in 03/276r0. Presentation in Singapore did not specify how the ranging precision is lowered from 57 to 10 cm.

SuggestedRemedy

I will consider changing my vote to Yes when the MB/OFDM proponents have demonstrated the requirements in 03/276r0 is met.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **123**

Sarallo, John — Appairent Technologie

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

The proposal has not provided a clear description of the method that will be used to address location awareness.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **145**

Wang, Jing — JWA Consulting, LLP

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

Location awareness issues is still not adequately addressed.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **82**

Choi, Yun Hwa — Samsung

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

MB-OFDM proposal is still unclear and not completely finalized. Every time I attend the standard meeting, MB-OFDM proposal would be somewhat changed. RF architecture of MB-OFDM looks stable, but base band algorithm looks with fluctuation. Please bring your own complete system proposal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **21**

Heberling, Allen — XtremeSpectrum, Inc.

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

Co-existence - The ability of the MB-OFDM proposal to dynamically modify its transmit spectrum to enable coexistence or worldwide regulatory compliance is based on its ability to dynamically turn on or off tones and bands. No mechanism has been identified to allow devices to coordinate this dynamic modification of the critical link parameters.

SuggestedRemedy

I will consider changing my NO vote to a YES vote if details are provided on how this dynamic spectral shaping via the turning OFF/ON of tones & bands can be accomplished in an effective way that does not impact the system performance or ability to support multiple piconets.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **25**

Heubaum, Karl — Motorola, Inc.

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

The MB-OFDM proposal relies on its ability to turn off tones and bands to comply with worldwide regulations and to avoid interference, but no mechanism for dynamically coordinating these actions among devices has been defined.

SuggestedRemedy

I will consider changing my no vote to yes if a mechanism is defined for coordinating the MB-OFDM proposal's dynamic spectral shaping behavior that does not adversely impact the proposal's system performance or its support for simultaneously operating piconets.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **52**

McInnis, Michael — The Boeing Company

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

The ability of the MB-OFDM to dynamically modify its transmit spectrum to enable coexistence or worldwide regulatory compliance is based on its ability to dynamically turn on or off tones and bands. No mechanism has been identified to allow devices to coordinate this dynamic modification of the critical link parameters.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **73**

Odman, Knut — XtremeSpectrum, Inc.

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

The MB/OFDM proposal does not indicate whether any changes in the 802.15.3 MAC are needed to support additional complexity for frequency hopping, and dynamic switching of hopping patterns, band use and tone selection. A timely implementation requires that any changes are kept to an absolute minimum. Other proposals have been put forth using the existing MAC standard unchanged.

SuggestedRemedy

I will consider changing my vote to Yes when it has been clarified that the MB/OFDM proposal can use the existing 802.15.3 MAC standard.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **121**

Sarallo, John — Appairent Technologie

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

The proposal has not made it clear what changes may be required in the 802.15.3 MAC to support this PHY. The proposal needs to clarify this.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **131**

Shvodian, Bill — XtremeSpectrum, Inc.

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

The ability of the MB-OFDM to dynamically modify its transmit spectrum to enable coexistence or worldwide regulatory compliance is based on its ability to dynamically turn on or off tones and bands. No mechanism has been identified to allow devices to coordinate this dynamic modification of the critical link parameters.

SuggestedRemedy

I will consider change my NO vote to a YES vote if details are provided on how this dynamic spectral shaping by turning off or on tones & bands can be accomplished in an effective way that does not impact the system performance or ability to support multiple piconets.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **136**

Takizawa, Kenichi CRL

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

The mechanism has not been identified to turn on or off tones to enable coexistence or Korea, Europe and Japan regulatory compliance.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **28**

Hoghooghi, Michael M. Motorola, Inc.

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

I also have substantial reservations on the compliance of the MBOA proposal in meeting the requirements of the TG3a PAR and its requirements. This issue seems to be sidestepped by the MBOA camp in their presentations and various discussions over the last several sessions.

SuggestedRemedy

I would require sound and logical explanation on how each one of these requirements are met and when they can be demonstrated.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **112**

Adams, Jon Motorola, Inc.

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

Second, DS-CDMA is more DC power efficient, making low-power transmitter implementation more practical. This is important for the future where UWB systems will be in battery powered devices. I see a future where cellphones and other portable devices have UWB systems within, and potentially even a crossover to 15.4a type systems if UWB is implemented there. A wall switch or RFID tag cannot be successful it it needs to rely upon a complex, power-hungry DSP to generate a simple transmit signal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **72**

Odman, Knut XtremeSpectrum, Inc.

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

Power consumption concerns with the MB/ODFM CCA approach and the complexity needed for frequency hopping.

SuggestedRemedy

I will consider changing my vote to Yes when power consumption figures not in excess of DS/CDMA has been shown under the exact same conditions and configuration.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **140**

van Leeuwen, Hans Smart Telecom Solutio

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

DS-CDMA seems more DC power efficient, making low-power transmitter implementation more practical.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **109**

Santoff, John PulseLINK, Inc.

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

OFDM backoff problems (such was the experience in 802.11a/g).

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **116**

Allen, Jim — Appairent Technologie

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

There are also assumptions made in the proposal about SOPs and the spectra of proposal one that will be practically limited by the FFT transforms and the usefulness of OFDM at higher rates (400 Mbps and above to a 1GHz). Those assumptions, I believe, are not dealt with fairly yet.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **81**

Choi, Sangsung — ETRI

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

FCC. SOP performance not shown.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **84**

Choi, Yun Hwa — Samsung

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

SOP with 802.15.3 MAC compliant. In mode 1 their proposal seems to have not satisfied with 4-SOP condition. Also if each mode 1 and mode 2 piconets are working simultaneously in same area, their time frequency hopping sequence may be collided. Another problem for SOP is that they have not showed the method to get the information of time frequency hopping sequence. How to get the information of TF sequence when a PNC makes a new piconet? PNC must know which TF sequence is used or not. That may make longer time to connect devices with UWB technologies.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **1**

Gandolfo, Pierre — XtremeSpectrum, Inc.

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

SOP performance for mode 1 and 2 devices is still unknown and inadequate since the results reported in the latest revision of doc #03268 (with 2 or 3 interferers) are based on " July simulation results" and as such do not take into account the time domain spreading enhancements presented in Singapore. Further, there has been no indication of how the proposal could scale to provide support for 8 full-rate piconets as requested by the Consumer Electronics SIG.

SuggestedRemedy

I would consider changing my NO vote to a YES vote if simulation results are produced for the current proposal that provide acceptable SOP performance and if it is shown that the proposal can scale to support 8 full-rate piconets.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **5**

Genossar, Michael — Adimos, Inc.

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

SOP - The performance in multiple SOP of this proposal is not sufficient.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **14**

Godfrey, Tim — Conexant Systems

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

In addition, the MB-OFDM proposal has a reduced effectiveness in performing the Clear Channel Assessment function, and may not provide an adequate number of Simultaneous Operating Piconets.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **20**

Heberling, Allen — XtremeSpectrum, Inc.

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

SOP - The ability of the MB-OFDM proposal to support multiple piconets is not adequate. The reported simulation results for SOP performance (with 2 or 3 interferers) have not been provided for the current proposal since July, and subsequent changes to the proposal would change those results. Further, there has been no indication of how the proposal could scale to provide support for 8 full-rate piconets as requested by the Consumer Electronics SIG (see doc 03/276r0).

SuggestedRemedy

I will consider changing my NO vote to a YES vote if simulation results are produced for the current proposal that provide acceptable SOP performance and if it is shown that the proposal can scale to support 8 full-rate piconets.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **26**

Heubaum, Karl — Motorola, Inc.

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

At the September 2003 meeting preliminary simulation results were presented for two simultaneously operating piconets operating at 110 and 200Mbps that reflected recent changes to the proposal. Full results for three and four simultaneously operating piconets at all data rates have not been presented, nor has there been any description of how the proposal can be scaled up to support eight simultaneously operating piconets, which is a requirement previously communicated to the task group by several consumer electronics companies.

SuggestedRemedy

I will consider changing my no vote to yes if acceptable full simulation results are provided for two, three, and four simultaneously operating piconets at all data rates, along with a roadmap for extending support to eight simultaneously operating piconets.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **34**

Hoghooghi, Michael M. — Motorola, Inc.

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

Provide proof that there are other OFDM-based systems exist that operate in similar environments, i.e.: uncoordinated overlapping signaling that allows multi-user operation.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **38**

Igler, Eran — Adimos, Inc.

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

The reasons for my No vote are: SOP - The performance in multiple SOP of this proposal is not sufficient.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **43**

Kohno, Ryuji — CRL

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

Multiple access interference in simultaneous operated piconets (SOP) should be analyzed much more because I doubt MB-OFDM can be stably operated. The MB-OFDM proposal's report results for SOP performance have not been provided for the current proposal since July, and subsequent changes to the proposal would change those results.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **58**

Mc Laughlin, Michael — decaWave LLC

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

I voted no because the MB-OFDM proposal has very poor performance for 2 and 3 interfering piconets.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **61**
Moore, Mark Artimi Ltd.

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

SOP.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **102**
Rasor, Gregg Motorola, Inc.

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

Proof that other OFDM based systems exist that operate in similar environments, i.e., uncoordinated overlapping signaling that allows multi-user operation.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **107**
Rofheart, Martin XtremeSpectrum, Inc.

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

Simulation results that show SOP performance for 2 or 3 interferers and how it would scale to 8 full rate pico-nets.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **119**
Santoff, John PulseLINK, Inc.

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

SOP performance not shown.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **130**
Shvodian, Bill XtremeSpectrum, Inc.

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

The ability of the MB-OFDM proposal to support multiple piconets is not adequate. The report results for SOP performance (with 2 or 3 interferers) have not been provided for the current proposal since July, and subsequent changes to the proposal would change those results. Further, there has been no indication of how the proposal could scale to provide support for 8 full-rate piconets as requested by the Consumer Electronics SIG.

SuggestedRemedy

I would consider changing my NO vote to a YES vote if simulation results are produced for the current proposal that provide acceptable SOP performance and if it is shown that the proposal can scale to support 8 full-rate piconets.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **134**
Takizawa, Kenichi CRL

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

The SOP performances of the MBOA proposal have not been shown sufficiently.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **148**
Welborn, Matt XtremeSpectrum, Inc.

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

The ability of the MB-OFDM proposal to support multiple piconets is not adequate. The report results for SOP performance (with 2 or 3 interferers) have not been provided for the current proposal since July, and subsequent changes to the proposal would change those results. Further, there has been no indication of how the proposal could scale to provide support for 8 full-rate piconets as requested by the Consumer Electronics SIG.

SuggestedRemedy

I would consider changing my NO vote to a YES vote if simulation results are produced for the current proposal that provide acceptable SOP performance and if it is shown that the proposal can scale to support 8 full-rate piconets.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **4**

Gandolfo, Pierre — XtremeSpectrum, Inc.

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

User tones should also be used for data transmission in order to increase spectral efficiency. But currently, those tones are only utilized for the sole purpose of filling a 500 MHz bandwidth so that it meets minimum FCC UWB bandwidth rules. I question whether this OFDM concept is truly an UWB waveform if unmodulated tones must be added to meet minimum FCC bandwidth requirements for UWB devices.

SuggestedRemedy

I will consider changing my NO to a YES if the MB-OFDM proposal provides these 10 user tones with some function(s) or uses them to increase the data rate.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **22**

Heberling, Allen — XtremeSpectrum, Inc.

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

BW Utilization - Unmodulated tones are utilized for the sole purpose of filling a 500 MHz bandwidth so that it meets minimum FCC UWB bandwidth rules. Energy is placed on 10 user tones to ensure that the spectrum has a bandwidth of greater than 500Mhz. I question whether this OFDM concept is truly an UWB waveform if unmodulated tones must be added to meet minimum FCC bandwidth requirements for UWB devices. The addition of unmodulated tones with the sole purpose of increasing bandwidth in order to meet minimum FCC bandwidth requirements is not an efficient use of the UWB spectrum.

SuggestedRemedy

I will consider changing my NO to a YES if the MB-OFDM proposal provides these 10 user tones with some function(s) or uses them to increase the data rate.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **124**

Schuster, Tom — Intermec Technologies

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

I am not convinced that the FCC will allow MB-OFDM to be considered UWB. IMHO, adding narrowband signals together until you get 500 MHz BW does not make a UWB signal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **126**

Seals, Michael — Conexant Systems

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

the waste of energy on 'user defined tones' that are there just to satisfy FCC rules

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **132**

Shvodian, Bill — XtremeSpectrum, Inc.

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

Unmodulated tones are utilized for the sole purpose of filling a 500 MHz bandwidth so that it meets minimum FCC UWB bandwidth rules. Energy is placed on 10 user tones to ensure that the spectrum has a bandwidth of greater than 500Mhz. I question whether this OFDM concept is truly an UWB waveform if unmodulated tones must be added to meet minimum FCC bandwidth requirements for UWB devices. The addition of unmodulated tones with the sole purpose of increasing bandwidth in order to meet minimum FCC bandwidth requirements is not an efficient use of the UWB spectrum.

SuggestedRemedy

I will consider changing my NO to a YES if the MB-OFDM proposal provides these 10 user tones with some function(s) or uses them to increase the data rate.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **135**

Takizawa, Kenichi — CRL

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

The mechanism has not been identified to turn on or off tones to enable coexistence or Korea, Europe and Japan regulatory compliance. I will consider changing my NO vote to a YES if these concerns are resolved.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **137**

Takizawa, Kenichi CRL

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

The mechanism has not been identified to turn on or off tones to enable coexistence or Korea, Europe and Japan regulatory compliance.

SuggestedRemedy

I will consider changing my NO vote to a YES if these concerns are resolved.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **149**

Welborn, Matt XtremeSpectrum, Inc.

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

Unmodulated tones are utilized for the sole purpose of filling a 500 MHz bandwidth so that it meets minimum FCC UWB bandwidth rules. Energy is placed on 10 user tones to ensure that the spectrum has a bandwidth of greater than 500Mhz. I question whether this OFDM concept is truly an UWB waveform if unmodulated tones must be added to meet minimum FCC bandwidth requirements for UWB devices. The addition of unmodulated tones with the sole purpose of increasing bandwidth in order to meet minimum FCC bandwidth requirements is not an efficient use of the UWB spectrum.

SuggestedRemedy

I will consider changing my NO to a YES if the MB-OFDM proposal provides these 10 user tones with some function(s) or uses them to increase the data rate.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **62**

Moore, Mark Artimi Ltd.

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

Technology (chips).

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **69**

Odman, Knut XtremeSpectrum, Inc.

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

Time to market. The MB/OFDM is less mature than alternate proposals. No base of real world implementations. An implementation according to the proposal is required to form a baseline.

SuggestedRemedy

I will consider changing my vote to Yes if a sufficient baseline prototype implementation is shown to base real world measurements on.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **96**

Rasor, Gregg Motorola, Inc.

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

Demonstration of digital / RF CMOS in generally available FABs (TI, Intel, TSMC, ST Micro) with sufficient performance to implement 15.3 radios yielding at 6 sigma levels. Specifically, 130 nM and 90 nM RF & digital CMOS.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **51**

Gifford, Ian XtremeSpectrum, Inc.

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

I'd like an analysis showing that performance of acquisition in the presence of multi-user interference. For example, acquisition in the presence of 3 interfering piconets. Part of the analysis should be a detailed explanation of the acquisition preamble. I'd like an analysis showing the support for CSMA in an overlapped MUI (multi-user, multi-piconet) environment. The analysis should include a time line.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **138**

Roberts, Rick XtremeSpectrum, Inc.

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

I'd like an analysis showing that performance of acquisition in the presence of multi-user interference. For example, acquisition in the presence of 3 interfering piconets. Part of the analysis should be a detailed explanation of the acquisition preamble.

SuggestedRemedy

I'll change my NO to a YES if this concern is addressed in writing (via a contribution to 802.15.3a).

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **43**

Gandolfo, Pierre XtremeSpectrum, Inc.

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

Association time (less than 500ms): it is also unclear to me how devices supporting mode 2 or potentially mode 3 in the future (i.e. 14 sub-band) could associate within less than 500ms, as required, by passively searching for all possible FH sequence combinations.

SuggestedRemedy

I will consider changing my NO vote to a YES if this concern is resolved.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **65**

Gifford, Ian XtremeSpectrum, Inc.

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

Also, last but not least I agree with ALL the other no voter comments on record and provided in this timeslot via e-mail and/or via a verbal delivery from the floor. Of note are the comments that suggest a second PHY or "optional 2nd PHY" re: Reede, Santhoff, and Siwiak.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **98**

McCorkle, John XtremeSpectrum, Inc.

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

In addition, I also want to express all the issues provided by Ian Gifford, Allen Heberling, and John Barr.

SuggestedRemedy

I WILL CONSIDER CHANGING MY VOTE FROM A NO TO A YES IF ALL OF THE ISSUES THEY RAISE ARE ADEQUATLY ADDRESSED.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **131**

Pardee, Jack innov8rs, LLC

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

Also need to hear acceptable answers to the questions raised by John Barr and Ian Gifford.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **198**

Rasor, Michael M. Motorola, Inc.

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

Incorporate by reference all comments set forth by the No voters, particularly those articulated by Paul Ballentine, John Barr, Alan Heberling, John McCorkle, Mike McInnis, and Kai Siwiak.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **216**

Rofheart, Martin XtremeSpectrum, Inc.

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

In addition, I also want to express my emphatic support for other dissenting voter comments especially those by Chris Fisher, Rick Roberts, Ian Gifford, Allen Heberling, Paul Ballentine, and John Barr.

SuggestedRemedy

I WILL CONSIDER CHANGING MY VOTE FROM A NO TO A YES IF ALL OF THE ISSUES MY DISSENTING COLLEAGUES RAISED ARE ADEQUATELY ADDRESSED.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **62**

Gifford, Ian XtremeSpectrum, Inc.

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

This proposal does not afford the user the ability to select and use bands individually. Rather than using Band A, perhaps I would rather use Band B, or Band C, or B and D.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **102**

McInnis, Michael The Boeing Company

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

This proposal does not afford the user the ability to select and use bands individually. Rather than using Band A, perhaps I would rather use Band B, or Band C, or Band D.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **14**

Barr, John Motorola, Inc.

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

Support for CCA/CSMA and CAP in 802.15.3 MAC. I do NOT have confidence that the MOFDM proposal has adequate support for clear channel assessment, or for CSMA MAC functions. The alternative ParthusCeva/XSI proposal showed a simple mechanism to simultaneously monitor the power received from all neighboring piconets on a continuous basis, with <5uS latency.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PROPOSAL CAN BE SHOWN TO HAVE SIMILAR SUPPORT AND PERFORMANCE WITH LOW ADDED COMPLEXITY.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **30**

Emami, Shariar Motorola, Inc.

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

Alternative CCA: The current CCA functionality relies on preamble and is not available all the time.

SuggestedRemedy

I will consider changing my vote from no to yes, if the coalition introduces an alternative CCA that does not depend on preamble and is available all the time.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **41**

Gandolfo, Pierre — XtremeSpectrum, Inc.

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

Support for CSMA/CA (CAP): do not have confidence that the MOFDM proposal has adequate support for a low power CCA scheme.

SuggestedRemedy

I will consider changing my NO vote to a YES if this concern is resolved.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **48**

Gifford, Ian — XtremeSpectrum, Inc.

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

Support for CCA/CSMA and CAP in 802.15.3 MAC. I do NOT have confidence that the MOFDM proposal has adequate support for clear channel assessment, or for CSMA MAC functions. The alternative ParthusCeva/XSI proposal showed a simple mechanism to simultaneously monitor the power received from all neighboring piconets on a continuous basis, with <5uS latency.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PROPOSAL CAN BE SHOWN TO HAVE SIMILAR SUPPORT AND PERFORMANCE WITH LOW ADDED COMPLEXITY.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **194**

Hoghooghi, Michael M. — Motorola, Inc.

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

Support for CCA/CSMA and CAP in 802.15.3 MAC - I do NOT have confidence that the MB-OFDM proposal has adequate support for clear channel assessment (CCA), or for CSMA MAC functions. The alternative XSi/ParthusCeva proposal showed a simple mechanism to simultaneously monitor the power received from all neighboring PicoNets on a continuous basis, with <5uS latency.

SuggestedRemedy

I will reconsider my NO vote [if] the MB-OFDM proposal is able to show similar capability and support without significantly adding complexity.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **81**

Jeon, Ho-In — Kyung-Won University

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

The CCA mechanism that the MB OFDM group provided was based upon the information delivered over preamble. Compared with that of XSI, I still do not have a confidence that MB group's mechanism is good enough. It can never be as fast as XSI's.

SuggestedRemedy

I can change my vote to YES if their CCA mechanism can prove that its performance is as good as XSI's.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **97**

McCorkle, John — XtremeSpectrum, Inc.

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

Support for CCA/CSMA and the CAP for the 802.15.3 MAC. I do NOT have confidence that the MOFDM PHY proposal has adequate support for clear channel assessment, or for CSMA MAC functions. The alternative ParthusCeva/XSI Proposal showed a simple mechanism to simultaneously monitor the power received from all neighboring piconets on a continuous basis, with < 5 us latency.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MODFM PROPOSAL CAN BE SHOWN TO HAVE SIMILAR SUPPORT AND PERFORMANCE WITH LOW ADDITIONAL COMLEXITY.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **215**

Rofheart, Martin — XtremeSpectrum, Inc.

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

Support for CCA/CSMA and the CAP for the 802.15.3 MAC. I do NOT have confidence that the MOFDM PHY proposal has adequate support for clear channel assessment, or for CSMA MAC functions. The alternative Parthusceva/XSI Proposal showed a simple mechanism to simultaneously monitor the power received from all neighboring piconets on a continuous basis, with <5us latency.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MODFM PROPOSAL CAN BE SHOWN TO HAVE SIMILAR SUPPORT AND PERFORMANCE WITH LOW ADDITIONAL COMLEXITY.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **199**

Rasor, Michael M. Motorola, Inc.

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

Satisfy ALL requirements set forth in the CE requirements presentation.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **19**

Chang, Soo-Young University of California,

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

The multiband system seems to be more complex than the proposed single band system. That causes high cost and bigger size.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **58**

Gifford, Ian XtremeSpectrum, Inc.

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

Complexity: An alternative proposal has been shown operate with superior performance, with much lower silicon area.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **69**

Gilb, James Appairent Technologie

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

A proper RF/analog analysis of the proposed frequency generation system, which is key to the implementation of this proposal, that provides the specifications necessary to implement this architecture. If the requirements are too restrictive, then the proposal will not be able to meet the goals of low cost, low complexity.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **195**

Hoghooghi, Michael M. Motorola, Inc.

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

It is widely believed that the UWB technologies will gain importance in the handheld and portable product space in the near future. It is not apparent to me that the use of a highly complex OFDM system lends itself well to simple, inexpensive communication devices providing robust performance and long battery life simultaneously.

SuggestedRemedy

I would reconsider my NO vote [only] when all these requirements are satisfied through a demonstrable implementation.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **82**

Jeon, Ho-In Kyung-Won University

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

The implementation complexity based upon OFDM, to my understanding, must be higher than that of XSI's. It can never be any simpler, any cheaper, less power-consuming than the XSI's mechanism.

SuggestedRemedy

I will change my vote if the implementation cost and power consumption can beat that of XSI's.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **110**

Mc Laughlin, Michael — ParthusCeva Inc.

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

Complexity: An alternative proposal has been shown operate with superior performance, with much lower silicon area.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **143**

Rypinski, Chandos — Individual

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

The TI proposal appears to optimize for bits/Hz when a more useful criteria would be maximum interference resistance. The frequency hopping appears to me to be a power density spreading artifice to use a narrowband technology when a direct wider band would better perform the function. The redundancy and aggressive FEC is fixing a less adequate radio modulation plan. The complex use of pilot tones, adaptively selected active channels may be intellectually clever, but not a simple way to operate the system. Moreover, the detail involved will make it unreasonably difficult for reproduction by multiple vendors. Given that the described plan works and meets most of the functional needs, I do not believe that is anywhere near the simplest possible equally satisfactory method.

SuggestedRemedy

Accordingly, there is no moderate repair that would change my NO vote to AFFIRM. If the architecture were modified to provide the same functional capability and advanced state of development as the second-voted proposal, I would be able to change my vote to Yes.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **156**

Schrader, Mark — Appairent Technologie

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

Complexity vs. Performance: The added complexity over the XSI implemented baseline must be shown to provide advantages in performance sufficient to justify is adoption.

SuggestedRemedy

There should be a solid basis for any complexity estimate used in the comparison.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **15**

Barr, John — Motorola, Inc.

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

I believe that UWB in the handheld and portable product space will become very important in the next 5 years. It is not apparent to me that the use of a highly complex OFDM system lends itself well to simple, inexpensive communications which have simultaneously robust performance and lends itself to long battery life.

SuggestedRemedy

CHANGING MY VOTE WOULD REQUIRE A DEMONSTRATION AT THE PRODUCT LEVEL OF A DEVICE THAT MEETS THE ROBUST PERFORMANCE AND COST REQUIREMENTS OF A CE DEVICE.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **49**

Gifford, Ian — XtremeSpectrum, Inc.

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

I believe that UWB in the handheld and portable product space will become very important in the next 5 years. It is not apparent to me that the use of a highly complex OFDM system lends itself well to simple, inexpensive communications which have simultaneously robust performance and lends itself to long battery life.

SuggestedRemedy

CHANGING MY VOTE WOULD REQUIRE A DEMONSTRATION AT THE PRODUCT LEVEL OF A DEVICE THAT MEETS THE ROBUST PERFORMANCE AND COST REQUIREMENTS OF A CE DEVICE.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **205**

Rasor, Michael M. — Motorola, Inc.

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

Maturity of solution: Proof that other OFDM based systems exist that operate in similar environments, i.e., uncoordinated overlapping signaling that allows multi-user operation.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **202**

Rasor, Michael M. Motorola, Inc.

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

Maturity of solution: Demonstration of a working prototype that implements effective protection (deleted tones, etc.) for specific licensed services and reserved bands without degrading information throughput to a level less than 95% of the expected maximum for the selected operating mode.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **90**

Lampe, John Nanotron Technologie

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

A merged proposal, perhaps one with both MB-OFDM and DS-CDMA modes would be compelling.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **207**

Rasor, Michael M. Motorola, Inc.

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

I will vote YES if the UWB PHY is selected from at least two options, that is the MAC is modified to negotiate which PHY is operational, e.g., the TI/Intel, et al. (MultiBand) proposal and the XSI-Motorola proposal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **136**

Reede, Ivan AmeriSys Inc.

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

As an alternative, in order to avoid a potentially time-extensive deadlock and provide for a lower risk path to 802.15.3a, I would suggest that the group strongly consider having two complementary PHYs, namely 802.15.3a - UWB and 802.15.3b, OFDM. I believe that such an approach would allow for one solution to win broad market acceptance via quick time to market. The other solution could then gain market share if it demonstrates FCC approval and superior cost/ performance. As has been demonstrated by numerous other 802 standards (802.3, 802.11), multi-mode devices make their way to the market as soon as multiple standards exist within similar market segments. Therefore, I would not expect market confusion by such a dual-mode solution but rather I would expect that the consumer market will ultimately reap the benefits of both solutions. Such a dual path solution, providing a contingency plan and a healthy competing environment would weigh in greatly as a means to change my no vote to a yes vote.

SuggestedRemedy

I therefore request the chair's (or his substitute) guidance in verifying if there is broad support for such a motion and guidance as to when I should make such a motion in time (if need be) for the upcoming 802.0 meeting.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **148**

Santoff, John PulseLINK, Inc.

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

Proposing two optional PHYs (CDMA-DS and MB-OFDM) and let the market be the decision maker.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **161**

Shvodian, Bill XtremeSpectrum, Inc.

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

Have 2 optional PHY modes, one with MB-OFDM and one with DS-CDMA and let the market decide. This is how 802.11 started.

SuggestedRemedy

This is an absolute requirement to change a no vote to a yes.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **1**

Alfvin, Rick — Appairent Technologie

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

Also, concern over FCC certification issue.

SuggestedRemedy

Will change vote if assured that certification will take place in a reasonable time.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **2**

Allen, Jim — Appairent Technologie

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

If the FCC does not allow the OFDM direction of the draft, that the TG use the second proposal as the draft basis.

SuggestedRemedy

I would change my NO to a YES if the proposer agrees.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **4**

Bahl, Venkat — Consultant

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

I would like to see comment from FCC before I change my vote to YES.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **5**

Ballentine, Paul — Motorola, Inc.

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

The OFDM can be shown to unequivocally meet the letter and spirit of the FCC UWB regulations. This is of tremendous importance not only for the success of UWB, but to protect the interests of the FCC stake holders - many of whom are Motorola's customers.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **9**

Barr, John — Motorola, Inc.

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

Regulatory Compliance (FCC). It appears as though FCC Certification may be an issue with the MOFDM proposal. This is not an issue with the XSI/Parthus Ceva proposal. Since this is the first standard for UWB radios, there are no existing implementations that can be used as examples of type qualified products.
Many of our customers have allocations within the spectrum shared by UWB, and it is our responsibility to protect their interests as well as those of this body. Approving a technique that appears to have significant regulatory challenge does not represent a responsible position.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PROPOSAL CAN PROVE UNEQUIVOCALLY THAT THE PROPOSAL IS COMPLIANT TO THE FCC REGS. AND DOES NOT SUFFER A PERFORMANCE DETRIMENT RELATIVE TO NON-FH PROPOSALS AS A RESULT OF THE FCC RULES.
FOR ME TO CHANGE MY VOTE WOULD REQUIRE A SYSTEM DEMONSTRATION THAT MEETS THE REGULATIONS AND DOES NOT INTERFERE WITH EXISTING LICENSED AND UNLICENSED RADIO SYSTEMS. AN EXAMPLE WOULD BE TO HAVE A WORKING PROTOTYPE THAT OBTAINS FCC APPROVAL UNDER PART 15.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **16**

Bourgeois, Monique — Motorola, Inc.

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

I want to hear an FCC ruling before we proceed.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **22**

Chang, Soo-Young — University of California,

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

OFDM systems need high signal-to-noise. I cannot see any technical information how this system works with restricted transmitted power environment given by FCC.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **18**

Chang, Soo-Young University of California,

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

FCC issues have to be checked with FCC. Or detailed information that assures these issues are not huddles for multiband proposal to be standardized has to be suggested.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **23**

Choi, Sangsung ETRI

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

First, MB-OFDM group must provide a clear ruling on FCC. The FCC regulation for UWB is one of important factors to make our own regulation for UWB in Korea. Currently, the FCC issue appears to be significant for MB-OFDM and tat the MB-OFDM has not been able to assure the group of this issue.

SuggestedRemedy

If the MB-OFDM group can provide a clear ruling on FCC, then the NO vote confirmation could be converted to a yes.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **25**

Cragie, Robert Charles Jennic Ltd.

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

I am concerned that we are hastily attempting to put into place as a standard a technique that has been subject to virtually no scrutiny by the FCC. The decision to create the UWB band was a huge challenge, and it is common knowledge that there are many powerful organizations who remain steadfastly opposed to UWB's access to those frequencies. I therefore do not believe it is pertinent for the IEEE to pass this early before there has been significantly more interaction with the FCC over the specific details of this approach, and ideally only when this approach has reached a level of reality far more visible than we have seen this week.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **26**

Dydyk, Michael Consultant

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

FCC issues unresolved.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **28**

Emami, Shariar Motorola, Inc.

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

FCC Regulatory issue: I would consider changing my vote from no to yes, if FCC put it in writing that a frequency hopping solution is not required to transmit 1/nth of permissible power as compared to a uniband system.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **32**

Fisher, Chris XtremeSpectrum, Inc.

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

Regulatory Compliance (FCC) It appears as though FCC Certification may be an issue with the MOFDM proposal. This is not an issue with the XSI/Parthus Ceva proposal.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PROPOSAL CAN PROVE UNEQUIVOCALLY THAT THE PROPOSAL IS COMPLIANT TO THE EXISTING FCC REGS AND DOES NOT SUFFER A PERFORMANCE DETRIMENT RELATIVE TO THE XSI/PARTHUS CEVA PROPOSAL AS A RESULT OF THE FCC RULES.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **36**

Fisher, Reed — Oki Electric Industry C

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

In the not so far away analog AMPS days (late 1980s), the system proponent built and field tested his system. He then went to a Standards body and got a system Standard. He did not show up with viewgraphs and simulations claiming that his system was the best. I am suspicious of hastily put-together consortiums such as the M-OFDM. More time must be allocated for further study and possible hardware demonstrations. Concerning the possible FCC problems:

SuggestedRemedy

I will consider changing my no vote to a yes vote if the 03/267r2 M-OFDM proponents can show that their proposal is compliant with the FCC regulations and does not show a performance detriment relative to non-OFDM proposals as a result of FCC rules. An example would be to have a working prototype that obtains FCC approval under 47 CFR part 15.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **37**

Gandolfo, Pierre — XtremeSpectrum, Inc.

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

Unresolved issues regarding FCC compliance for FH-UWB systems.

SuggestedRemedy

As such, I'd like a clear statement from the FCC clarifying the rules for FH-UWB systems.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **44**

Gifford, Ian — XtremeSpectrum, Inc.

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

Regulatory Compliance (FCC). It appears as though FCC Certification may be an issue with the MOFDM proposal. This is not an issue with the XSI/Parthus Ceva proposal.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PROPOSAL CAN PROVE UNEQUIVOCALLY THAT THE PROPOSAL IS COMPLIANT TO THE EXISTING FCC REGS AND DOES NOT SUFFER A PERFORMANCE DETRIMENT RELATIVE TO THE XSI/PARTHUS CEVA PROPOSAL AS A RESULT OF THE FCC RULES.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **66**

Gilb, James — Appairent Technologie

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

FCC compliance at proposed power levels with the proposed modulation format.

SuggestedRemedy

FCC certification of a device that uses the proposed modulation at the proposed power level within a reasonable period of time would address the concern.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **70**

Godfrey, Tim — Intersil Corporation

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

There is still uncertainty in the area of FCC regulations.

SuggestedRemedy

I would like to see the matter resolved via a direct communication between this group and the FCC, if possible.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **71**

Gorday, Paul — Motorola, Inc.

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

Satisfactory resolution to the FCC rules issue facing the frequency hopping.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **74**

Gutierrez, Jose — Eaton Corporation

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

Without closure in the regulatory issue we should not pursue the OFDM technology.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **75**

Heberling, Allen — XtremeSpectrum, Inc.

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

Compliance with the FCC UWB regs. Slide 60 of doc: 03/267r5 recognizes that the lack of FCC compliance is an issue and that it needs to be addressed by the MB-OFDM coalition before the 15.3a community will feel comfortable.

SuggestedRemedy

Consequently, I will not change my NO vote until the FCC has unequivocally issued a ruling on the MB-OFDM measurement procedure.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **187**

Herold, Barry — Motorola, Inc.

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

Regulatory compliance. It is not clear that even within the relatively well understood US domain, the FCC will allow operation as proposed.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **191**

Hoghooghi, Michael M. — Motorola, Inc.

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

Regulatory Compliance (FCC) - My concerns revolve around FCC Certification issue with the MB-OFDM proposal. There are no existing implementations that can be used as examples of type qualified products, especially since this is the first instantiation of this standard for UWB radios. I will consider changing my NO vote if the MB-OFDM proposal can prove unequivocally that the proposal is compliant to the FCC regulations [and] its performance does NOT suffer relative to non-FH proposals (for example: XSi/ParthusCeva proposal) as a result of the FCC rules. There are already many existing customers with allocations within the spectrum shared by UWB - we have a responsibility to protect their interests as well as those of this body. Approving a technique that appears to have significant regulatory challenge does not represent a responsible position.

SuggestedRemedy

I will consider changing my NO vote if the MB-OFDM proposal can demonstrate a system meeting regulatory requirements without interfering with existing radio systems in the licensed and unlicensed spectrum shared by UWB devices. This may be accomplished by gaining FCC Part-15 approval for a working prototype.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **80**

Ishii, Katsumi — JVC

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

I am concerned about the FCC issue.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **86**

Kraemer, Bruce — Intersil

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

Any IEEE standards proposal should be acceptable in world regulatory domains. It is not clear that even within the relatively well understood US domain, the FCC will allow operation as proposed. Adequate and open dialog with the FCC, and others, must be established to indicate feasibility.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **89**

Lampe, John — Nanotron Technologie

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

It is not clear to me that the proposal will meet regulatory requirements.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **91**

Martin, Frederick — Motorola

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

FCC regulations. At this time, it is not clear that the OFDM solution can be implemented under FCC rules because of frequency hopping rules currently in effect.

SuggestedRemedy

Reasonable assurances must be offered that the OFDM approach, as presented, meets FCC guidelines.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **107**

Mc Laughlin, Michael — ParthusCeva Inc.

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

It is clear to me that the PHY being proposed here may not meet the FCC regulatory requirements at its advertised performance figures.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **93**

McCorkle, John — XtremeSpectrum, Inc.

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

FCC Regulatory Compliance. I believe that the MBOFDM radio will definitely fail FCC Certification tests under the current FCC rules, or have its performance crippled by power reductions required to get it to pass FCC certification tests. The XSI/ParthusCeva proposal clearly meets the FCC rules at the full power allowed by the FCC as used in the XSI/ParthusCeva analysis.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PROPOSAL CAN PROVE WITH LEGALLY BINDING DOCUMENTATION THAT THE PROPOSED RADIO IS COMPLIANT TO THE FCC REGS AT THE FULL POWER AS ANALYZED IN THE MOFDM PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **101**

McInnis, Michael — The Boeing Company

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

All link budget assumptions in this proposal are questionable and cannot be relied upon as being accurate until the FCC comments on whether the power levels presented to us in this proposal are allowed by current FCC UWB rules.

SuggestedRemedy

The FCC must be consulted by the TG3a chair and parties from both proposal submitters, and asked to comment on the power levels provided to us in this proposal, then if the power levels must be changed in this proposal, new link budgets and performance figures must be provided and compared to the XtremeSpectrum proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **112**

Morelli, Anthony — Intersil Corporation

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

There is too much controversy over regulatory issues.

SuggestedRemedy

I would like further clarification of the FCC rules prior to changing my vote to yes.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **113**

Naeve, Marco — Eaton Corporation

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

Reason for no vote: The issues surrounding the FCC regulations are troubling. The OFDM approach is a long way from realization, and based upon the limited evidence shown here and the hesitancy of the OFDM coalition to work this week with the FCC to start to understand any specific issues, I have to hold off on approval until the OFDM group is a farther down the road toward implementation. That's why I have supported the motion from earlier this week to ask the chair for organizing a conference call with the FCC.

SuggestedRemedy

For me to change my vote I propose that the presenters of the OFDM and the XSI solution work together to come up with a merged proposal that is FCC compliant and present it to the group.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **117**

Obara, Kei — CRL Yokosuka

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

FCC issue.

SuggestedRemedy

I would vote Yes if the modified OFDM proposal can prove that the proposal is compliant to the FFC regulations.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **118**

Odman, Knut — XtremeSpectrum, Inc.

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

Unclear issues regarding FCC compliance for frequency hopping UWB. A ruling by FCC that MB/OFDM will be in compliance with their UWB rules is required.

SuggestedRemedy

I will consider changing my vote to Yes if the FCC rules that MB/OFMD is compliant with FCC UWB.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **129**

Pardee, Jack — innov8rs, LLC

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

FCC issue.

SuggestedRemedy

Could be resolved by a statement from the FCC indicating that the proposed solution will be acceptable to them and an analysis showing that FCC compliant operation suffers no significant performance penalty relative to the XSI solution.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **204**

Rasor, Michael M. — Motorola, Inc.

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

Maturity of solution: Proven levels of radiated and conducted emissions not only per the FCC rules, but sufficiently low to permit co-integration of the resulting devices in units mentioned above.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **208**

Rasor, Michael M. Motorola, Inc.

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

Real world considerations:
- According to ANSI C63.4-1992 which is referenced for measurement in the FCC Part 15., the MultiBand proposal MUST present at a minimum, simulations that clearly follow the following requirements:
13.1 Requirements of Intentional Radiators
13.1.1 Operating Conditions
"...Devices that use frequency-sweeping techniques shall have their frequency stopped at each of the frequencies specified above." (Above this there is a table stating that for frequencies above 10 MHz, 3 points need to be taken: one at the low end, one at the high end, and one in the center of the band.)
13.1.4.2 Final Radiated Emissions Measurements
"Devices transmitting pulsed emissions and subject to a limit requiring an average detector function for radiated emissions shall initially be measured with an instrument that uses a peak detector. A radiated emissions measured with a peak detector may then be corrected to a true average using the appropriate factor for emission duty cycle. This correction factor relates the measured peak level to the average limit and is derived by averaging absolute field strength over on complete pulse train that is 0.1s, or less, in length..."
13.1.7 Occupied Bandwidth Measurements
"In order to measure the modulated signal properly, a resolution bandwidth that is small compared to the bandwidth required by the procuring or regulatory agency shall be used on the measuring equipment. However, the 6 dB resolution bandwidth of the measuring equipment shall be set to a value greater than 5% of the bandwidth requirements. When no bandwidth requirements are specified, the minimum 6 dB resolution bandwidth of the measuring instrument is..." [100 kHz minimum resolution bandwidth for 1 to 40 GHz from Table. "NOTE At the frequency range boundaries, the smaller resolution bandwidth shall be used."
One section, in particular, alludes to an opposite issue:
14.1 Limit Relaxation for Transients
"For many devices, transients of short duration repeated infrequently do not cause significant interference..." (This is precisely the opposite of the multi-band UWB approach, because the communication is based on short transients repeated VERY frequently.)

The preceding requirement attempts to expose characteristics of so-called "designer waveforms" that may have an unacceptable peak to average ratio, that causes significant interference in a victim receiver having a bandwidth less than or equal to 50 MHz in the design operating band, e.g., 3.1 to 10.6 GHz.
The present OFDM approach, when viewed from the standpoint of a victim receiver, creates more intense energy in the operating bandwidth due to the design characteristics of the waveform. Compare this to a waveform that by design looks like noise to a receiver. Since receivers are designed to operate in environments with noise (commonly referred to as noise limited systems rather than interference limited systems), modulations like CDMA and particularly in conjunction with direct sequence spread spectrum (DSSS) techniques, will ALWAYS produce less interference in a given victim receiver.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **135**

Reede, Ivan AmeriSys Inc.

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

One of the five criteria set by the PAR is technical feasibility. In my interpretation, the proposed solution must comply with FCC (and other world-wide regulatory bodies) rules and regulations. If this is not satisfied, then I have to conclude that although a solution may be technically sound, it may not be legally deployed. In such a case, another of the five criteria, namely broad market potential is not satisfied. At this point in time, I have seen reasonable objections and have sought and obtained reasonable response to convince me that the selected proposed solution may not meet the requirements or that meeting the requirements may seriously impair the performance claimed by the proposers. Namely, if the proposed solution is classified as a "frequency hopper" by the FCC or another regulatory body deem that TX power measurements be made with all the energy concentrated in a single band, it is possible that he Tx power may need to be reduced substantially, thereby reducing range and/or throughput in a significant manner. Furthermore, I am not sure that the proposed modulation mechanism will be classified as "ultra-wideband" instead of multi-tone OFDM. In the later case, we have no band to transit over. Period. Therefore, we are far from assured that we have a technically feasible or deployable solution with "broad market" potential. My major concern here is to avoid having the body work for a period of time only to find later in the future that the proposed solution doesn't comply to regulations and is therefore banned in one or more regions of the planet.

SuggestedRemedy

Therefore, in order to eliminate this objection, I would need a written interpretation from each of the concerned regulatory bodies stating that the proposed solution complies to their requirement, in every aspect, including the definition of ultra-wideband. I would also need to see a confirmation that the performance obtained under those constraints is substantially the same or superior to the performance proposed in all their presentations up to date.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **140**

Roberts, Rick XtremeSpectrum, Inc.

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

I'd like assurance from the FCC on the legality of this frequency hopping system. This should be in the form of a written response to a submitted written inquiry.

SuggestedRemedy

I'll change my NO to a YES if this concern is addressed in writing (via a contribution to 802.15.3a).

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **211**

Rofheart, Martin — XtremeSpectrum, Inc.

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

FCC Regulatory Compliance. I believe that the MBOFDM radio will definitely fail FCC Certification tests under the current FCC rules, or have its performance crippled by power reductions required to get it to pass FCC certification tests. The XSI/Parthusceva proposal clearly meets the FCC rules at the full power allowed by the FCC as used in the XSI/Parthusceva analysis.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PROPOSAL CAN PROVE WITH LEGALLY BINDING DOCUMENTATION THAT THE PROPOSED RADIO IS COMPLIANT TO THE FCC REGS AT THE FULL POWER AS ANALYZED IN THE MOFDM PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **151**

Santoff, John — PulseLINK, Inc.

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

Unclear on not just FCC but International regulatory issues of MB-OFDM

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **153**

Sarallo, John — Appairent Technologie

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

With so much riding on the acceptance and success of this technology it seems careless to adopt a technology while questions concerning the regulatory compliance of that technology remain.

SuggestedRemedy

I will consider changing my no vote to yes if FCC approval of the MB-OFDM proposal at the proposed power levels is obtained, or, in the event that FCC approval can not be obtained within a reasonable timeframe, a means exists for adopting the second place solution.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **157**

Schrader, Mark — Appairent Technologie

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

Compliance with FCC UWB Regulations: may not be possible without a reduction in power by factor that would make the proposed multiband solution not meet the range requirements.

SuggestedRemedy

Compliance must be shown by a ruling by the FCC.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **158**

Seals, Michael — Intersil Corporation

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

It is not clear to me that the proposal will meet regulatory requirements.

SuggestedRemedy

A clear statement from the FCC addressing the output power of a frequency hopped UWB radio would help to sway my vote to a yes.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **159**

Shiraki, Yuichi — Oki

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

I will consider changing my No to a Yes if the modified OFDM proposal can prove that the proposal is compliant to the FFC regulations and does not suffer a performance detriment relative to non-FH proposals as a result of the FCC rules. An example would be to have a working prototype that obtains FCC approval under Part 15.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **160**

Shvodian, Bill — XtremeSpectrum, Inc.

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

Regulatory compliance: We need clear and definitive FCC approval of the multiband OFDM proposal at the power levels proposed BEFORE affirmation.

SuggestedRemedy

This is an absolute requirement to change a no vote to a yes.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **166**

Siwiak, Kai — Independent

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

There are several FCC issues regarding acceptability of the OFDM proposal as being within the scope of the Report and Order.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **217**

Stevenson, Carl — Agere Systems

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

I voted NO on the 802.15.3a WG confirmation ballot because of concerns with respect to regulatory acceptability of the proposed solution. Not only is it far less than clear to me that the proposed solution fits the FCC's UWB rules, it is abundantly clear that, even if it does, UWB is not approved an any other country of the world that I am aware of. There are studies on UWB compatibility issues going on in ITU-R TG-1/8 and many administrations are EXTREMELY skeptical of the practicality of "underlaying" UWB on broad swaths of spectrum that are already occupied by other users. An analysis of the interference potential of UWB was presented as a contribution to 802.18 at our July 2003 Plenary meetings (18-03-0049-00-0000_Est_UWB_Interference_Pot_M_Lynch.pdf), but has not been fully evaluated by 802.18. It is, IMHO, likely that there will be future challenges to the FCC's UWB rules, and they may result in changes in those rules.

SuggestedRemedy

Bottom line ... I am loath to vote to approve going forward with a standard based on a technology that is, for the foreseeable future, destined for a niche market in the US, if that. To change my NO vote to a YES vote would require either a change to a technology that I have confidence is broadly acceptable in a regulatory sense, or to prove that the current proposal s broadly acceptable in a regulatory sense. (To be candid, I have doubts that the 2nd alternative in the above paragraph can be met in any reasonable time frame.)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **170**

Struik, Rene — Certicom Corporation

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

I do not feel confident as to the risk level associated with adopting this proposal. From the discussions, it seems that there are a few risk factors associated with adopting this proposal, which are hard to assess and which do not seem to hold - or to a far lesser degree - for the competing XtremeSpectrum proposal. There seem to be regulatory concerns as to whether the proposal complies with current FCC regulations. Furthermore, IEEE should be very reluctant in adopting a technology that might not meet the broad market potential and technical feasibility requirements in the PAR. It is unclear whether working implementations will be available from multiple vendors in time (witness mentioning of the 2005 timeframe), whether complexity and cost metrics would allow wide scale adoption in the market place, and some concerns have been expressed as to reliability and demonstrated system feasibility at this present moment in time.

SuggestedRemedy

I would be willing to change my NO vote to YES, once these regulatory and technical maturity concerns are adequately addressed. Let us not rush forward with a standard with high associated or perceived risk. If we would do it wrong this time, we might establish a negative image on UWB technology in general.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **173**

Wang, Jerry — XtremeSpectrum, Inc.

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

FCC Regulatory Compliance. It appears as though FCC Certification may be an issue with the Multiband-OFDM proposal. This is not an issue with the XSI/Parthus Ceva proposal.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PROPOSAL CAN PROVE UNEQUIVOCALLY THAT THE PROPOSAL IS COMPLIANT TO THE EXISTING FCC REGULATION AND DOES NOT SUFFER A PERFORMANCE DETRIMENT RELATIVE TO THE XSI/PARTHUS CEVA PROPOSAL AS A RESULT OF THE FCC RULES.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **175**

Wang, Jing — JWA Consulting, LLP

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

FCC and regulatory issues are far from clear for the MB-OFDM proposal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **179**

Welborn, Matt — XtremeSpectrum, Inc.

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

First, I feel that I have had insufficient time to review the Multiband OFDM proposal. However, based on my current understanding, the following issues would need to be corrected: (1) Based on a personal review of FCC UWB rules and associated documents, I believe that the Multiband OFDM proposal would not comply with a plain reading of the current rules. Regardless of any claims of non-interference, I believe the FCC could not certify such devices without a change to the rules or significant modifications to the proposal. Remedy: rule change/clarification or modify proposal to non-frequency hopping.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **183**

Wilson, Richard — Independent

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

Regulatory Compliance (FCC). It appears as though FCC Certification may be an issue with the MOFDM proposal. This is not an issue with the XSI/Parthus Ceva proposal.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PROPOSAL CAN PROVE UNEQUIVOCALLY THAT THE PROPOSAL IS COMPLIANT TO THE EXISTING FCC REGS AND DOES NOT SUFFER A PERFORMANCE DETRIMENT RELATIVE TO THE XSI/PARTHUS CEVA PROPOSAL AS A RESULT OF THE FCC RULES. An example would be to have a working prototype that obtains FCC approval under Part 15.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **186**

Zyren, Jim — Intersil Corporation

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

There are too many unresolved regulatory matters.

SuggestedRemedy

If it is possible, a telecon between the FCC and this Task Group (moderated by the Chair on our end) would be an effective manner of getting our questions answered and ensuring that everyone hears the same answers.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **55**

Gifford, Ian — XtremeSpectrum, Inc.

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

Poor performance at high bit rates. An alternative proposal has been shown to operate at almost twice the range at 480Mbps.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **105**

Mc Laughlin, Michael — ParthusCeva Inc.

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

Poor performance at high bit rates. An alternative proposal has been shown to operate at almost twice the range at 480Mbps.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **96**

McCorkle, John XtremeSpectrum, Inc.

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

Performance. The MOFDM proposal has not shown that it can scale in the future. The XSI/ParthusCeva proposal scales beyond that of MOFDM, particularly in the area of operating range and especially in the context of noise that is dominated by larger numbers of full-rate simultaneously operating piconets.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL SHOWS A MECHANISM TO SCALE BEYOND THE PERFORMANCE OF THE BASIC OFDM IN THE EXISTING PROPOSAL TO HAVE PERFORMANCE SIMILAR TO THAT IN THE ADVANCED MODES SHOWN IN THE XSI/PARTHESCEVA PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **214**

Rofheart, Martin XtremeSpectrum, Inc.

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

Performance. The MOFDM proposal has not shown that it can scale in the future. The XSI/ Parthusceva proposal scales beyond that of MOFDM, particularly in the area of operating range and especially in the context of noise that is dominated by larger numbers of full-rate simultaneously operating piconets.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL SHOWS A MECHANISM TO SCALE BEYOND THE PERFORMANCE OF THE BASIC OFDM IN THE EXISTING PROPOSAL TO HAVE PERFORMANCE SIMILAR TO THAT IN THE ADVANCED MODES SHOWN IN THE XSI/PARTHESCEVA PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **152**

Santoff, John PulseLINK, Inc.

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

Data rate is not scalable at range. With only 520 MHz of spectrum to spread pulse energy across it will severely limit range or data rate at range.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **63**

Gifford, Ian XtremeSpectrum, Inc.

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

I would like to see an OFDM Band A interference impact statement on the PCS (cell phone) band and devices (which are also operating in the UWB band) compared to the impact of the XtremeSpectrum proposal on the PCS band devices.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **103**

McInnis, Michael The Boeing Company

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

I would like to see an OFDM band A interference impact statement on the PCS (cell phone) band and devices (which are also operating in the UWB band) compared to the impact of the XtremeSpectrum proposal on the PCS band devices.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **203**

Rasor, Michael M. Motorola, Inc.

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

Maturity of solution: Demonstration of co-location capability with portable electronic devices such as cell phones, portable MP3 players, etc.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **24**

Choi, Sangsung ETRI

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

Second, MB-OFDM group must all file LOAs to assure the group of no IP.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **150**

Santoff, John PulseLINK, Inc.

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

Unclear on potential IP Issues. Not just IP related to members of the 802.15.3 Standard group but also any person company or group that may IP in this area that are NOT part of the 802.15.3a process.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **6**

Ballentine, Paul Motorola, Inc.

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

I have serious doubts about the ability of the OFDM approach to meet the PAR requirements and to meet the requirements set forth by the CE coalition this week. Specifically, the ranging capability of the OFDM approach must meet the PAR requirements.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **13**

Barr, John Motorola, Inc.

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

Location Awareness. The MOFDM Alliance proposal does not address the selection criteria of location awareness. They self evaluated their proposal with a zero (0) vs. a plus (+) ref -03/267r5, slide 43, relative to location capability. The SG and now TG have received application information suggesting that location awareness is important. A recent contribution -0/269r0 indicates that location awareness is critical to support public safety, and security.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL IS CLEARLY SHOWN TO PROVIDE LOCATION CAPABILITY THAT CAN BE IMPLEMENTED FROM THE PROPOSED STD. THE COMPLEXITY OF THE IMPLEMENTATION MUST BE CLEARLY STATED.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **31**

Emami, Shariar Motorola, Inc.

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

Location accuracy: Other proposals such as that proposed by XSI/Parthus Ceva can also benefit from averaging to improve its estimate.

SuggestedRemedy

I will consider changing my vote from no to yes, if the coalition can match or exceed the location estimate reported by XSI/Parthus Ceva.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **35**

Fisher, Chris XtremeSpectrum, Inc.

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

Location Awareness. The MOFDM Alliance proposal does not adequately address the selection criteria of location awareness. They self evaluated their proposal with a zero (0) vs. a plus (+) ref -03/267r5, slide 43, relative to location capability. The SG and now TG have received application information suggesting that location awareness is important. A recent contribution -0/269r0 indicates that location awareness is critical to support public safety, and security.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL IS CLEARLY SHOWN TO PROVIDE LOCATION CAPABILITY WITH EQUAL OR SUPERIOR PERFORMANCE TO THE XSI/PARTHUS CEVA PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **40**

Gandolfo, Pierre — XtremeSpectrum, Inc.

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

The MBOA proposal must describe how to provide better resolution for ranging since this is one of the key requirements.

SuggestedRemedy

I will consider changing my NO vote to a YES if this concern is resolved.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **47**

Gifford, Ian — XtremeSpectrum, Inc.

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

Location Awareness. The MOFDM Alliance proposal does not adequately address the selection criteria of location awareness. They self evaluated their proposal with a zero (0) vs. a plus (+) ref -03/267r5, slide 43, relative to location capability. The SG and now TG have received application information suggesting that location awareness is important. A recent contribution -0/269r0 indicates that location awareness is critical to support public safety, and security.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL IS CLEARLY SHOWN TO PROVIDE LOCATION CAPABILITY WITH EQUAL OR SUPERIOR PERFORMANCE TO THE XSI/PARTHUS CEVA PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **67**

Gilb, James — Appairent Technologie

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

Provide an clear description of the technique that would be used to provide location awareness.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **72**

Gorday, Paul — Motorola, Inc.

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

Evidence that the multiband OFDM proposal can achieve the same location resolution with the same complexity as the merged UWB (Xtreme/ParthusCeva) proposal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **78**

Heberling, Allen — XtremeSpectrum, Inc.

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

Location Awareness: Slides 63-69 of doc: 03/267r5 attempted to address the issue of location awareness. Yet slide 69 evades the issue by claiming that the solution of this issue is a vendor specific implementation. In addition, the information conveyed in slides 63-69 does not address the requirements specified in slide 11 of doc: 03/276r0.

SuggestedRemedy

Consequently, until the MB-OFDM proposal demonstrates a location awareness capability that can provide a resolution of less than 30cm at 10m or more, my NO vote will remain a NO.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **190**

Herold, Barry — Motorola, Inc.

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

Location awareness. Implementation of location awareness is not clear at all.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **192**

Hoghooghi, Michael M. Motorola, Inc.

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

Location Awareness - The MB-OFDM alliance proposal does not address the selection criteria of location awareness. They self-evaluated their proposal with a zero (0) vs. a plus (+) ref -03/267r5, slide 43, relative to location capability. The SG and now TG have received application information suggesting that location awareness is important. A recent contribution -0/269r0 indicates that location awareness is critical to support public safety, and security.

SuggestedRemedy

I will reconsider my NO vote [if] MB-OFM proposal is clearly shown to provide location capability that can be implemented from the proposed standard while clearly stating the added complexity for support of this requirement.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **94**

McCorkle, John XtremeSpectrum, Inc.

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

Location Awareness. The MOFDM Alliance proposal does not address the selection criteria of location awareness. The SG and now TG have received application information suggesting that location awareness is important. Contribution -0/269r0 shows that location awareness is critical to support public safety, and security. With little support, the MOFDM Alliance proposal suggests it can provide 57 cm accuracy, while 0/269r0 indicates that 10cm is desirable. The alternative ParthusCeva/XSI Proposal documents 10cm accuracy already working.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL SHOWS A CLEAR MECHANISM TO PROVIDE SIMILAR (10cm) PERFORMANCE AND THAT THIS MECHANISM CAN BE IMPLEMENTED WITH LITTLE ADDED COMLEXITY.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **104**

McInnis, Michael The Boeing Company

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

This proposal needs to clarify and state how it supports ranging and location determination.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE OFDM PROPOSAL CAN PROVE UNEQUIVOCALLY THAT THE PROPOSAL IS COMPLIANT TO THE FCC REGS AS IT IS CURRENTLY PROPOSED, DOES NOT SUFFER A PERFORMANCE DETRIMENT RELATIVE TO WHAT HAS BEEN PROPOSED AS A RESULT OF THE FCC RULES, THE 10 USER TONES ARE PROVIDED WITH SOME FUNCTIONALITY OTHER THAN FOR JUST STUFFING THE BAND WITH ENERGY TO MEET MINIMUM FCC UWB REQUIREMENTS - IN OTHER WORDS PROVIDE FULL EFFICIENT USE OF THE MINIMUM UWB BANDWIDTH DEFINED FOR US BY THE FCC, AN OFDM INTERFERENCE IMPACT ANALYSIS ON PCS BAND USERS IS PROVIDED, THE ABILITY TO SELECT AND USE THE GROUP A, B, C, AND D BANDS INDIVIDUALLY IS PROVIDED IN THE PROPOSAL, AND RANGING AND LOCATION DETERMINATION IS PROVIDED AND DEFINED SATISFACTORILY IN THE PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **121**

Odman, Knut XtremeSpectrum, Inc.

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

Limited support for location awareness. CE5 required location awareness with a resolution on 30 cm on 10 m distance in 03/276r0.

SuggestedRemedy

I will consider changing my vote to Yes when the MB/OFDM proponents have demonstrated the requirements in 03/276r0 is met.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **130**

Pardee, Jack innov8rs, LLC

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

Location awareness. This was cited as an important need by the CE community.

SuggestedRemedy

I would need to see some credible data indicating that the proposed solution can support this requirement at least as well as the XSI proposal. Also need to hear acceptable answers to the questions raised by John Barr and Ian Gifford.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **210**

Rasor, Michael M. Motorola, Inc.

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

There is no clear demonstrated location and positioning capability, which again several varieties of impulse radio approaches have demonstrated.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **133**

Reede, Ivan AmeriSys Inc.

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

I believe that location awareness is becoming a more and more important reality and therefore would like to ensure that a new PHY will provide such to a granularity equal or less than 5 cm. The reason for this granularity is that it would allow to place a device within a room, allowing discrimination as to which side of the wall, ceiling or floor it is. This requires X,Y and Z axis coordinates within a resolution of 5 cm. I believe that two back to back devices (phones, hard drives, wall mount plasma TV, etc) must be readily location identified. Since 5 cm can change the room or cubicle in which they are located, then such resolution becomes important. Although this may seem un-necessary, there is great value in controlling where data and requests come from (geographically) and where data and responses are sent to, it may form a crucial element of authentication. Current authentication mechanisms currently requre relatively complex administration based on licensed keys, algorithms or other. For many markets, data integrity and security is insufficient. In these markets, geographical location authentication should add significant value and reduce resistance to market penetration. With positive and precise location, a request issued from a device located at the expected and/or allowed premises would provide added authentication and traceability value than a signal with the right address and keys coming from "somewhere" within RF range. With positive and precise location, a device can be managed by physical location (e.g. "DVD in the living room" or "Scanner in the office" or "Printer in the basement" or "Fridge in the kitchen" is much more user friendly than "0xAE4C9D7FDBC4" or "192.168.2.31:31759" or ... electronic ID's). If the fridge is replaced, with location awareness, the network may be able to self-adjust without any user intervention. With positive and precise location, a request issued from an improper location {neighbouring room, parking lot, adjoining floor} could be identified, the perpetrator located, and appropriate security measures taken. Moreover, services could be delivered to the proper device with much less administration overhead than is currently required. (i.e. you may allow devices in a conference room to access the network in a more limited fashion than the adjoining room's CAD station or in a less limited fashion than the next door neighbor.) Joining a network could controlled down to at a very low level. The best data security is deny access to any device outside an "electronic fence" area. Quality of service can be better served to devices remaining within the "electronic fence". Automated handoff (make before break) can be better served if you know how fast a device is moving and direction of motion of the device. If you know where the neighbouring access points are located, you can prepare the handoff, routing, etc... before it is needed and probably performing in a more harmonious fashion than the panic realization that the signal is getting too weak and broadcasting acquisition message to any and all "in the area".

SuggestedRemedy

Therefore, in order to eliminate this objection, I would need to understand and be satisfied what economical mandatory mechanism (PHY, MAC and upper layer interface, etc...) would be included in the standard and be provided by the proposed solution to provide location awareness to this granularity.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **212**

Rofheart, Martin — XtremeSpectrum, Inc.

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

Location Awareness. The MOFDM Alliance proposal does not address the selection criteria of location awareness. The SG and now TG have received application information suggesting that location awareness is important. Contribution -0/269r0 shows that location awareness is critical to support public safety, and security. With little support, the MOFDM Alliance proposal suggests it can provide 57 cm accuracy, while 0/269r0 indicates that 10cm is desirable. The alternative Parthusceva/XSI Proposal documents 10cm accuracy already working.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL SHOWS A CLEAR MECHANISM TO PROVIDE SIMILAR (10cm) PERFORMANCE AND THAT THIS MECHANISM CAN BE IMPLEMENTED WITH LITTLE ADDED COMLEXITY.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **144**

Santoff, John — PulseLINK, Inc.

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

Location/position capability not clearly quantified, proven or demonstrated.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **155**

Schrader, Mark — Appairent Technologie

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

Location Awareness: The method presented for pulse position estimation was not sufficiently thought out or documented. This includes its accuracy though simulation.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **164**

Shvodian, Bill — XtremeSpectrum, Inc.

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

Location awareness. The MBOA proposers are working on how to provide better ranging, but it is not fully known yet.

SuggestedRemedy

The proposal must describe how to provide accurate ranging.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **168**

Siwiak, Kai — Independent

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

There is no clear demonstrated location and positioning capability, which again several varieties of impulse radio approaches have demonstrated.

SuggestedRemedy

I will consider voting YES for a proposal that rectifies my objections: (1) resolve fully the FCC questions, (2) bring a market ready solutions that are out of the research stage, (3) a clear location and positioning solution is demonstrated, (4) additional deficiencies that I haven't thought of, but raised by other NO voters have been similarly resolved. I will vote YES if the UWB PHY is optional, that is the TI/Intel, et al. proposal is modified to include a suitable second PHY which meets all my criteria.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **177**

Wang, Jing — JWA Consulting, LLP

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

The location awareness implementation is not clear at all.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **181**

Welborn, Matt — XtremeSpectrum, Inc.

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

Unproven claims to location awareness. I would need to see a proposed algorithm/technique for deriving a range measurement over multiple frequency hops, and it would need to be a solution that would not require significant complexity or complicated synchronization between devices.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **182**

Wilson, Richard — Independent

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

Location Awareness. The MOFDM Alliance proposal does not adequately address the selection criteria of location awareness. They self evaluated their proposal with a zero (0) vs. a plus (+) ref -03/267r5, slide 43, relative to location capability. The SG and now TG have received application information suggesting that location awareness is important. A recent contribution -0/269r0 indicates that location awareness is critical to support public safety, and security.

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL IS CLEARLY SHOWN TO PROVIDE LOCATION CAPABILITY WITH EQUAL OR SUPERIOR PERFORMANCE TO THE XSI/PARTHUS CEVA PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **42**

Gandolfo, Pierre — XtremeSpectrum, Inc.

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

How does the MBOA proposal intends to support streaming applications using pseudo-static GTS slots, which by definition are allowed to miss beacons, is unclear to me. This also requires further clarification.

SuggestedRemedy

I will consider changing my NO vote to a YES if this concern is resolved.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **68**

Gilb, James — Appairent Technologie

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

Need to state what changes, if any, are required in the 802.15.3 MAC to support this PHY. It isn't clear how this proposal will mesh with our current MAC.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **79**

Heberling, Allen — XtremeSpectrum, Inc.

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

Impact on the 15.3 MAC: The MB-OFDM proposal does not address the issue of impact on the 15.3 MAC. It is unclear from doc: 03/267r5 what changes to the 15.3 MAC will be required to support frequency hopping, adaptively turning on and off frequency bands, and multi-piconet support.

SuggestedRemedy

Consequently, until the MB-OFDM provides more details regarding the effect these characteristics will have on the existing 15.3 MAC my NO vote will remain as is.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **115**

Ngo, Chiu — Samsung

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

The proposal does not address much on its implication to 802.15.3 MAC and how much MAC enhancement needs to be done.

SuggestedRemedy

Suggestion: Consider to change to "YES" if the proposal has plan to demonstrate its solution early 2004 and the current proposal addresses the amount of 802.15.3 MAC needs to be changed/enhanced.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **124**

Odman, Knut XtremeSpectrum, Inc.

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

The MB/OFDM proposal does not indicate whether any changes in the 802.15.3 MAC are needed to support additional complexity for frequency hopping, different CCA and multi-piconet support. A timely implementation requires that any changes are kept to an absolute minimum. Other proposals have been put forth using the existing MAC standard unchanged.

SuggestedRemedy

I will consider changing my vote to Yes when it has been clarified that the MB/OFDM proposal can use the existing 802.15.3 MAC standard.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **149**

Santoff, John PulseLINK, Inc.

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

Unclear on changes that would need to be made to support OFDM MAC.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **20**

Chang, Soo-Young University of California,

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

My impression is that merger work is not fully integrated into one proposal. It is not clear how the final proposed system works after merging proposals.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **53**

Gifford, Ian XtremeSpectrum, Inc.

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

I'd like the submission of draft text, in the form of a contribution to 802.15.3a, for the combined OFDM proposal, including the material from the ST Micro merger. This text will be used to establish the baseline draft text. In addition to the appropriate PHY clauses, included should be all expected modifications to MAC headers/commands/PIBs, including beacon related changes.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **76**

Heberling, Allen XtremeSpectrum, Inc.

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

ST-Micro-TI/Intel merger. Lack of detail regarding the ST-Micro and the TI/Intel merged proposal was severely lacking in detail.

SuggestedRemedy

Consequently, until I see the details of the merged proposal I will not change my NO vote to a YES.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **120**

Odman, Knut XtremeSpectrum, Inc.

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

The result of the merger between MB-OFDM and ST Micro is not known. Considering that the two proposals are fundamentally different it is not possible to get a clear picture of how the two would be merged.

SuggestedRemedy

I will consider changing my vote to Yes when the final proposal is presented.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **128**

Pardee, Jack innov8rs, LLC

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

Overall performance. Since the all of the elements of the earlier proposals now merged into the omnibus MB-OFDM proposal have not been fully reconciled, let alone integrated and tradeoffs made.

SuggestedRemedy

Need to see an analysis of the integrated proposed solution.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **141**

Roberts, Rick XtremeSpectrum, Inc.

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

I'd like the submission of draft text, in the form of a contribution to 802.15.3a, for the combined OFDM proposal, including the material from the ST Micro merger. This text will be used to establish the baseline draft text. In addition to the appropriate PHY clauses, included should be all expected modifications to MAC headers/commands/PIBs, including beacon related changes.

SuggestedRemedy

I'll change my NO to a YES if this concern is addressed in writing (via a contribution to 802.15.3a).

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **64**

Gifford, Ian XtremeSpectrum, Inc.

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

I'd like a detailed explanation of forming spectral "notches" using active notch forming (i.e. notch forming via a technique other than just turning off a tone). In particular I'd like information on the degree of computational complexity required to calculate and form the active notches "on-the-fly".

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **142**

Roberts, Rick XtremeSpectrum, Inc.

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

I'd like a detailed explanation of forming spectral "notches" using active notch forming (i.e. notch forming via a technique other than just turning off a tone). In particular I'd like information on the degree of computational complexity required to calculate and form the active notches "on-the-fly".

SuggestedRemedy

I'll change my NO to a YES if this concern is addressed in writing (via a contribution to 802.15.3a).

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **57**

Gifford, Ian XtremeSpectrum, Inc.

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

High Power consumption: An alternative proposal has been shown operate with superior performance, with much lower power consumption.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **109**

Mc Laughlin, Michael ParthusCeva Inc.

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

High Power consumption: An alternative proposal has been shown operate with superior performance, with lower power consumption.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **123**

Odman, Knut XtremeSpectrum, Inc.

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

Power consumption concerns with the MB/ODFM CCA approach and the complexity needed for frequency hopping.

SuggestedRemedy

I will consider changing my vote to Yes when power consumption figures not in excess of DS/CDMA has been shown under the exact same conditions and configuration.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **127**

Pardee, Jack innov8rs, LLC

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

Meeting of CE requirements. The MB-OFDM needs to demonstrate power consumption equity or advantage over the XSI proposal based on similar usage scenarios - especially for applications (e.g. mobile) which require a high percentage of time spent listening for traffic.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **165**

Shvodian, Bill XtremeSpectrum, Inc.

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

Low power CCA is required that does not depend on preamble acquisition. This is needed for low power CSMA/CA and low power scan.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **50**

Gifford, Ian XtremeSpectrum, Inc.

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

In conjunction with the frequency generation and up/down conversion ... I want an RF analysis showing the rejected image rejection and LO leakage rejection over the full bandwidth of the proposed OFDM multi-band system. Reference to breadboard results, test chips and published results would be most helpful.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **209**

Rasor, Michael M. Motorola, Inc.

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

I insist on establishing a common baseline as a basis for comparison of proposals - full disclosure is required of the MATLAB code and its embodied rationale which forms the basis of the calculations used to predict performance of the MB-OFDM proposal.

SuggestedRemedy

EACH proposer MUST come clean! Without this information, the group cannot make an informed decision.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **137**

Roberts, Rick XtremeSpectrum, Inc.

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

In conjunction with the frequency generation and up/down conversion, I want an RF analysis showing the rejected image rejection and LO leakage rejection over the full bandwidth of the proposed OFDM multi-band system. Reference to breadboard results, test chips and published results would be most helpful.

SuggestedRemedy

I'll change my NO to a YES if this concern is addressed in writing (via a contribution to 802.15.3a).

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **7**

Ballentine, Paul — Motorola, Inc.

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

I do not believe the OFDM approach can support the 4 SOP as required by the PAR, let alone the 8 or more requested by the CE companies.

SuggestedRemedy

I would consider changing my vote if the OFDM approach provides convincing data that these conditions can be met.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **12**

Barr, John — Motorola, Inc.

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

Simultaneous Operating Piconets (SOP), PER THE 802.15.3A PAR. I do NOT have confidence that the MOFDM proposal fully understands the recent contribution -0/276r0 from a few of our members on the issue of "Consumer Electronic Requirements for TG3a". Specifically, the alliance proposal will initially provide for only three (3) SOP vs. their requirement "...Number of overlapping SOP: Absolute minimum: 4, Target: 8+" the alternative ParthusCeva/XSI Proposal indicated "Operation with up to 8 simultaneous piconets".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL IS REVISED TO TECHNICALLY SUPPORT A MINIMUM OF FOUR (4) SOPs WITH A DISTANCE RATIO OF LESS THAN 1.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **34**

Fisher, Chris — XtremeSpectrum, Inc.

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

Simultaneous Operating Piconets (SOP). I do NOT have confidence that the MOFDM proposal fully understands the recent contribution -0/276r0 from a few of our members on the issue of "Consumer Electronic Requirements for TG3a". Specifically, the MOFDM proposal will initially provide for only three (3) SOP vs. their requirement "...Number of overlapping SOP: Absolute minimum: 4, Target: 8+" the alternative ParthusCeva/XSI Proposal indicated "Operation with up to 8 simultaneous piconets".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL IS REVISED TO TECHNICALLY SUPPORT A MINIMUM OF FOUR (4) SOPs.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **39**

Gandolfo, Pierre — XtremeSpectrum, Inc.

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

Simultaneously operating piconets: The SOP performance of the MBOA proposal is inadequate to meet the requirements.

SuggestedRemedy

I will consider changing my NO vote to a YES if this concern is resolved.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **56**

Gifford, Ian — XtremeSpectrum, Inc.

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

Poor performance with simultaneously operating piconets, e.g. a piconet operating at 110Mbps at 6m cannot cope with a single adjacent piconet which is closer than 5 meters whereas an alternative solution has been presented which, under the same conditions, can cope with an adjacent piconet only 2.5 meters away.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **46**

Gifford, Ian — XtremeSpectrum, Inc.

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

Simultaneous Operating Piconets (SOP). I do NOT have confidence that the MOFDM proposal fully understands the recent contribution -0/276r0 from a few of our members on the issue of "Consumer Electronic Requirements for TG3a". Specifically, the MOFDM proposal will initially provide for only three (3) SOP vs. their requirement "...Number of overlapping SOP: Absolute minimum: 4, Target: 8+" the alternative ParthusCeva/XSI Proposal indicated "Operation with up to 8 simultaneous piconets".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL IS REVISED TO TECHNICALLY SUPPORT A MINIMUM OF FOUR (4) SOPs.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **52**

Gifford, Ian — XtremeSpectrum, Inc.

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

I'd like an analysis showing the support for CSMA in an overlapped MUI (multi-user, multi-piconet) environment. The analysis should include a time line.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **189**

Herold, Barry — Motorola, Inc.

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

Simultaneously operating piconets. We need 4 or more.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **193**

Hoghooghi, Michael M. — Motorola, Inc.

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

Simultaneous Operating PicoNets (SOP), PER THE 802.15.3A PAR - I do NOT have confidence that the MB-OFDM proposal fully understands the recent contribution -0/276r0 from a few of our members on the issue of "Consumer Electronic Requirements for TG3a". Specifically, the MB-OFDM alliance proposal will initially provide for only three (3) SOP vs. their requirement "...Number of overlapping SOP: Absolute minimum: 4, Target: 8+" the alternative ParthusCeva/XSI Proposal indicated "Operation with up to 8 simultaneous PicoNets".

SuggestedRemedy

I will reconsider my NO vote [if] the MB-OFDM proposal is revised to support this requirement and provide technical justifications for support of four (4) SOPs, as a minimum, with a distance ration of less than 1.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **84**

Jeon, Ho-In — Kyung-Won University

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

The XSI's proposal can have as many as 8 SOP's, while MB group can provide only 3 SOP's, if I am correct.

SuggestedRemedy

I will change my vote if they can extend the number of SOP's to as many as 8.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **88**

Lampe, John — Nanotron Technologie

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

The performance of the MB OFDM proposal does not meet the market requirements for simultaneously operating piconets.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **106**

Mc Laughlin, Michael — ParthusCeva Inc.

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

Poor performance with simultaneously operating piconets, e.g. a piconet operating at 110Mbps at 6m cannot cope with a single adjacent piconet any closer than 5 meters whereas an alternative solution has been presented which, under the same conditions, can cope with an adjacent piconet only 2.5 meters away.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **122**

Odman, Knut XtremeSpectrum, Inc.

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

The CE group's requirements in 03/276r0 is not met or at the best met only poorly. For instance the CE group wants support for up to 8 simultaneous piconets.

SuggestedRemedy

I will consider changing my vote to Yes when the MB/OFDM proponents have demonstrated that all requirements in 03/276r0 are met.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **139**

Roberts, Rick XtremeSpectrum, Inc.

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

I'd like an analysis showing the support for CSMA in an overlapped MUI (multi-user, multi-piconet) environment. The analysis should include a time line.

SuggestedRemedy

I'll change my NO to a YES if this concern is addressed in writing (via a contribution to 802.15.3a).

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **147**

Santoff, John PulseLINK, Inc.

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

Capability to demonstrate 4 coexisting piconets not clearly defined or demonstrated.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **163**

Shvodian, Bill XtremeSpectrum, Inc.

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

Simultaneously operating piconets. The SOP performance of the MB OFDM proposal is inadequate to meet the requirements.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **180**

Welborn, Matt XtremeSpectrum, Inc.

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

I feel that the multi-piconet performance in inadequate (at least for Mode I).

SuggestedRemedy

Remedy: support for 4 overlapping piconets in Mode I.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **29**

Emami, Shariar Motorola, Inc.

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

Poor utilization of capacity The utilization of capacity is very poor in mode 1 (with 3 bands) in the sense of utilizing a large percentage of tones in a time slot by the piconets.

SuggestedRemedy

I would consider changing my vote from no to yes, if the coalition improved the efficiency of mode 1 to that of mode 2 (with 7 subbands).

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **54**

Gifford, Ian XtremeSpectrum, Inc.

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

The OFDM symbol at lower rates emits unmodulated tones containing no data that are not used for other functions like they are in 802.11a.

SuggestedRemedy

Willing to change if the emitted waveform is made more efficient and "emissions-responsible."

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **60**

Gifford, Ian — XtremeSpectrum, Inc.

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

Unmodulated tones are utilized for the sole purpose of filling a 500 MHz bandwidth so that it meets minimum FCC UWB bandwidth rules. Energy is placed on 10 user tones to ensure that the spectrum has a bandwidth of greater than 500Mhz. I question whether this OFDM concept is truly an UWB waveform if unmodulated tones must be added to meet minimum FCC bandwidth requirements for UWB devices. The addition of unmodulated tones with the sole purpose of increasing bandwidth in order to meet minimum FCC bandwidth requirements is not an efficient use of the UWB spectrum. These 10 user tones should be provided with some function(s) or to increase the data rate.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **99**

McInnis, Michael — The Boeing Company

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

Unmodulated tones are utilized for the sole purpose of filling a 500 MHz bandwidth so that it meets minimum FCC UWB bandwidth rules. Energy is placed on 10 user tones to ensure that the spectrum has a bandwidth of greater than 500Mhz. I question whether this OFDM concept is truly an UWB waveform if unmodulated tones must be added to meet minimum FCC bandwidth requirements for UWB devices. The addition of unmodulated tones with the sole purpose of increasing bandwidth in order to meet minimum FCC bandwidth requirements is not an efficient use of the UWB spectrum.

SuggestedRemedy

These 10 user tones should be provided with some function(s) or to increase the data rate.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **111**

Miller, Leonard — National Institute of St

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

The OFDM symbol at lower rates emits unmodulated tones containing no data that are not used for other functions like they are in 802.11a.

SuggestedRemedy

Willing to change if the emitted waveform is made more efficient and "emissions-responsible."

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **134**

Reede, Ivan — AmeriSys Inc.

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

Ten unmodulated user tones... will these interfere with licensed bands? How will the tones be selected... and how will the devices assure that these tones (read Carriers) will not impair or interfere with licensed user bands unused at certain times but used or critical at other times.

SuggestedRemedy

Therefore, in order to eliminate this objection, said tones would have to be removed and the freed spectrum be used to transmit useful information not to "mimic" a UWB signal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **3**

Bahl, Venkat — Consultant

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

The time line for products is too far out, I am not convinced enough work, and the ability to have CMOS based solutions will be available for the next couple of years (at a minimum).

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **8**

Ballentine, Paul — Motorola, Inc.

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

I do not believe the OFDM approach can meet the time to market requirements consistent with the needs of the industry.

SuggestedRemedy

I would consider changing my vote if there is convincing evidence that the OFDM approach can be available in the 2004 time frame.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **11**

Barr, John Motorola, Inc.

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

The PAR specifies that the approved instantiation should be implementable. It is obvious from the presentations to date that the MOFDM proposal is mostly analysis and in some cases, perhaps even PowerPoint. On the other hand, XSI has demonstrated a working solution at the chip level which meets regulatory requirements and the PAR.

SuggestedRemedy

I MAY BE ABLE TO CHANGE MY POSITION ONCE THE MOFDM APPROACH HAS PROGRESSED MUCH CLOSER TO PRACTICE.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **10**

Barr, John Motorola, Inc.

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

Time To Market (TTM). I do NOT have confidence that the MOFDM proposal will expeditiously execute the project deliverables i.e., the DRAFT standard will be delayed relative to the ParthusCeva/XSI Proposal. Specifically, the MBOFDM proposal -03/267r5, slide 36 indicates "Time to market: the earliest complete CMOS PHY solutions would be ready for integration is 2005." The alternative ParthusCeva/XSI Proposal indicated "Time to market Silicon in 2003".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MODFM PRODUCTS ARE AVAILABLE IN 2004.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **17**

Callaway, Ed Motorola, Inc.

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

Concerned about time to market.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **21**

Chang, Soo-Young University of California,

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

Maturity is another item. It entails time-to-market issues.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **27**

Dydyk, Michael Consultant

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

Time to market is at least two to four years in the future. Maturity of CMOS technology at microwave frequency: (1) The government and industry spent several billions to develop MMIC technology at microwave frequencies using GaAs because Si is very lossy as a transmission media. To my knowledge this has not changed. (2) Developing a working circuit function takes several iterations with each iteration lasting at least 6 months resulting in several years cycle to a complete chip set. This would be followed by another several years cycle for single chip development.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **33**

Fisher, Chris XtremeSpectrum, Inc.

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

Time To Market (TTM). I do NOT have confidence that the MOFDM proposal will expeditiously execute the project deliverables i.e., the DRAFT standard will be delayed relative to the ParthusCeva/XSI Proposal. Specifically, the MBOFDM proposal -03/267r5, slide 36 indicates "Time to market: the earliest complete CMOS PHY solutions would be ready for integration is 2005." The alternative ParthusCeva/XSI Proposal indicated "Time to market Silicon in 2003".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL CAN DEMONSTRABLY SHOW EQUIVALENT TTM RELATIVE TO THE XSI/PARTHUS CEVA PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **38**

Gandolfo, Pierre XtremeSpectrum, Inc.

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

The MBOA proposal does not have acceptable time to market. Technology that can be easily built today is required.

SuggestedRemedy

I will consider changing my NO vote to a YES if this concern is resolved.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **61**

Gifford, Ian XtremeSpectrum, Inc.

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

This proposal relies too heavily on the development of future CMOS chip technology (year 2005 or beyond) for expansion into the Group B (4.9 to 6.0 GHz), Group C (6.0 to 8.1 GHz), and Group D (8.1 to 10.6 GHz) bands. This future CMOS technology may not arrive as soon as the proposers have predicted and there is no guarantee that new CMOS technology will work in the Group B, C, and D bands efficiently enough to expand this proposal into the higher bands as proposed in the near future.

SuggestedRemedy

I'll consider changing my NO to a YES if my concern is addressed in writing (via a contribution to 802.15.3a)

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **45**

Gifford, Ian XtremeSpectrum, Inc.

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

Time To Market (TTM). I do NOT have confidence that the MOFDM proposal will expeditiously execute the project deliverables i.e., the DRAFT standard will be delayed relative to the ParthusCeva/XSI Proposal. Specifically, the MBOFDM proposal -03/267r5, slide 36 indicates "Time to market: the earliest complete CMOS PHY solutions would be ready for integration is 2005." The alternative ParthusCeva/XSI Proposal indicated "Time to market Silicon in 2003".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL CAN DEMONSTRABLY SHOW EQUIVALENT TTM RELATIVE TO THE XSI/PARTHUS CEVA PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **59**

Gifford, Ian XtremeSpectrum, Inc.

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

This committee has more work to do. The PAR specifies that the approved instantiation should be implementable. It is obvious from the presentations to date that the OFDM proposal is mostly analysis and in some cases, perhaps even PowerPoint. Power consumption numbers are based seemingly wholly on analysis rather than actual silicon. On the other hand, XSI has demonstrated a working solution at the chip level which appears to meet regulatory requirements and the PAR.

SuggestedRemedy

Therefore I need to see this committee push with further steps toward hardware. I may be able to change my position once the OFDM approach has progressed much closer to practice.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **73**

Gorday, Paul Motorola, Inc.

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

Evidence that the multiband OFDM proposal can meet the same time-to-market (2004) time frame as the merged (XtremeSpectrum/Parthus Ceva) proposal.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **77**

Heberling, Allen XtremeSpectrum, Inc.

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

Time to Market. Slide 34 of doc: 03/267r5 states that product based on 90 nm CMOS will be available in 2005. No mention is made as to which quarter it will be available. Yet slide 11 of doc: 03/276r0 indicates that the CE companies would prefer product in 2004. Based on comments made during the MB-OFDM presentations and panel discussions. It is clear that the MB-OFDM coalition does not have a demonstrable UWB implementation.

SuggestedRemedy

Consequently, my NO vote will remain until the MB-OFDM provides a demonstrable implementation that meets the requirements stated in doc: 03/031r11.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **188**

Herold, Barry — Motorola, Inc.

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

Time to Market. We need a proposal that is ready now.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **197**

Hoghooghi, Michael M. — Motorola, Inc.

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

The PAR specifies that the approved instantiation should be [implementable]. It is obvious from the presentations to date that the MB-OFDM proposal is mostly analysis and in some cases, perhaps even slide-ware. On the other hand, XSI has demonstrated a working solution at the chip level meeting regulatory [and] PAR requirements.

SuggestedRemedy

I may reconsider my position when/if the MB-OFDM progresses into a 'practical' stage.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **196**

Hoghooghi, Michael M. — Motorola, Inc.

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

Time-To-Market (TTM) - I do NOT have confidence that the MB-OFDM proposal will expeditiously execute the project deliverables (i.e., the DRAFT standard will be delayed relative to the XSi/ParthusCeva proposal. Specifically, the MB-OFDM proposal -03/267r5, slide 36 indicates "Time to market: the earliest complete CMOS PHY solutions would be ready for integration is 2005." The alternative XSi/ParthusCeva proposal indicated "Time to market Silicon in 2003."

SuggestedRemedy

I will consider changing my NO vote IF the MB-OFDM products are made available in 2004.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **83**

Jeon, Ho-In — Kyung-Won University

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

Time-to-the market issue is the most important reason.

SuggestedRemedy

I would change my NO vote to YES if I can have it in 2004.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **85**

Kim, Kyoung A — Samsung

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

Time to Market. The CE companies wants acceptable technology for time to market. But the Multi-band OFDM isn't clear for time to market.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **87**

Lampe, John — Nanotron Technologie

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

The MBOA proposal does not have an acceptable time to market. Technology that can be economically built in volume soon is required.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **92**

Martin, Frederick — Motorola

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

Time to market. While the OFDM solution shows great promise, it is not at the level of maturity as some of the other proposals that have been offered.

SuggestedRemedy

Reasonable assurances need to be offered that a solution could be implemented in a timeframe similar to that of other proposals that have been presented.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **108**

Mc Laughlin, Michael — ParthusCeva Inc.

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

Time to market. The earliest availability of silicon for this proposal is 2005. An alternative proposal has ICs available today, which have the ability to be adapted to the precise protocols laid down by the standard, within a very short time of the standard being issued.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **95**

McCorkle, John — XtremeSpectrum, Inc.

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

Time To Market (TTM). I do NOT believe that the MOFDM proposal will expeditiously result in products that are economically viable. I believe that the DRAFT standard using MBOFDM will be significantly delayed relative to the ParthusCeva/XSI Proposal. Specifically, the MBOFDM proposal -03/267r5, slide 36 indicates "Time to market: the earliest complete CMOS PHY solutions would be ready for integration is 2005." The alternative ParthusCeva/XSI Proposal indicated "Time to market: Silicon in 2003".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MODFM PROPOSAL CAN BE CHANGED TO SHOW A LOW RISK ROADMAP THAT RESULTS IN ECONOMICALLY VIABLE PRODUCTS HAVE A HIGH LIKELIHOOD OF BEING AVAILABLE IN 2004.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **100**

McInnis, Michael — The Boeing Company

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

This proposal relies too heavily on the development of future CMOS chip technology (year 2005 or beyond) for expansion into the Group B (4.9 to 6.0 GHz), Group C (6.0 to 8.1 GHz), and Group D (8.1 to 10.6 GHz) bands. This future CMOS technology may not arrive as soon as the proposers have predicted and there is no guarantee that new CMOS technology will work in the Group B, C, and D bands efficiently enough to expand this proposal into the higher bands as proposed in the near future.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **114**

Ngo, Chiu — Samsung

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

Concern about time-to-market. For CE companies, time to market is very important. We would like to have a good UWB solution in a predictable time-frame. The current solution has not been proven/demonstrated yet.

SuggestedRemedy

Suggestion: Consider to change to "YES" if the proposal has plan to demonstrate its solution early 2004 and the current proposal addresses the amount of 802.15.3 MAC needs to be changed/enhanced.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **116**

Obara, Kei — CRL Yokosuka

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

Time to market. MBOFDM proposal indicates it needs longer time to be released to the market.(Year 2005) compared with ParthusCeva/XSI proposal (2003).

SuggestedRemedy

I would change my proposal to "yes" if the MBOFDM proposal needs same "time to market" time as ParthusCeva/XSI proposal.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **119**

Odman, Knut — XtremeSpectrum, Inc.

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

Time to market. The MB/OFDM is less mature than alternate proposals. No base of real world implementations. An implementation according to the proposal is required to form a baseline.

SuggestedRemedy

I will consider changing my vote to Yes if a sufficient baseline prototype implementation is shown to base real world measurements on.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **126**

Pardee, Jack innov8rs, LLC

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

Time to Market. The MB-OFDM minimum time to market of 2005 predicated on multiple concurrent technology developments is too tenuous.

SuggestedRemedy

Would like to see a table indicating the basis on which the claims of superior performance over other proposals are based.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **125**

Pardee, Jack innov8rs, LLC

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

Consistent basis for comparison of proposals. The basis of the calculations used to predict performance of the MB-OFDM proposal appears to include data from simulations, sub-circuit test results, and extrapolations of simulated operation.

SuggestedRemedy

Would like to see a table indicating the basis on which the claims of superior performance over other proposals are based.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **132**

Poor, Robert Ember Corporation

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

The principal objective of the TG3a standards process is to produce a commercially viable, broadly adopted wireless communication standard. I assert that a short time to market is the dominant factor for TG3a's success, and even if the ODFM PHY offered an order of magnitude improvement over the XtremeSpectrum implementation, it would not justify a delay to market. The history of 802.11 supports this assertion: the first popular 802.11 PHY was one megabit per second. While it was subsequently replaced by 802.11b's PHY -- with an order of magnitude increase in performance -- the early establishment of infrastructure and mindshare were crucial to the adoption and eventual success of the 802.11 WLAN family.

SuggestedRemedy

In conclusion, any proposed merits OFDM may have over the XtremeSpectrum implementation don't justify a delay to getting to market.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **201**

Rasor, Michael M. Motorola, Inc.

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

Maturity of solution: Demonstration of digital / RF CMOS in generally available FABs (TI, Intel, TSMC, ST Micro) with sufficient performance to implement 15.3 radios yielding at 6 sigma levels and operational at a 5 nines reliability standard. Specifically, 130 nM and 90 nM RF & digital CMOS.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **200**

Rasor, Michael M. Motorola, Inc.

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

Maturity of solution: Demonstration of digital / RF CMOS in generally available FABs (TI, Intel, TSMC, ST Micro) with sufficient performance to implement 15.3 radios yielding at 6 sigma levels and operational at a 5 nines reliability standard. Specifically, 130 nM and 90 nM RF & digital CMOS.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **206**

Rasor, Michael M. Motorola, Inc.

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

Maturity of solution: Substantiated proof that the analog RF sections are realizable and less complex than those seen in 802.11a IC's.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **213**

Rofheart, Martin — XtremeSpectrum, Inc.

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

Time To Market (TTM). I do NOT believe that the MOFDM proposal will expeditiously result in products that are economically viable. I believe that the DRAFT standard using MBOFDM will be significantly delayed relative to the Parthusceva/XSI Proposal. Specifically, the MBOFDM proposal -03/267r5, slide 36 indicates "Time to market: the earliest complete CMOS PHY solutions would be ready for integration is 2005." The alternative ParthusCeva/XSI Proposal indicated "Time to market: Silicon in 2003".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MODFM PROPOSAL CAN BE CHANGED TO SHOW A LOW RISK ROADMAP THAT RESULTS IN ECONOMICALLY VIABLE PRODUCTS HAVE A HIGH LIKELIHOOD OF BEING AVAILABLE IN 2004.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **145**

Santoff, John — PulseLINK, Inc.

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

Short time to market requirement is not achieved. There have been dozens of companies that have been researching and validating Uniband like UWB for 100's of man-years over the last decade. The UWB-OFDM solution being proposed has been in existence for a matter of weeks and has NOT been thru the same diligence process.

SuggestedRemedy

Their needs to be more time for analysis to validate implementation and architectural issues associated with it.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **146**

Santoff, John — PulseLINK, Inc.

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

I see multiple technical issues on the implementation side that I don't see a clear path to resolution for a Low cost/Low power solution. Due to the accelerated timelines associated with this UWB-OFDM there are technical issues that have not been addressed or maybe not even considered. Example: I have heard from multiple proponents of the UWB-OFDM solution that this solution will enable a 100% CMOS solution in either 90 or 130 nm CMOS process.. These processes have operating voltages in the neighborhood of 1 to 1.5 Volts. How are they going to drive from CMOS an antenna that will require voltages 2 or 3 times the operating voltage of the CMOS chip? This will most likely require an external Power Amplifier. I haven't heard anyone talk about such implementation details. The overall maturity of a UWB OFDM system is questionable.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **154**

Schrader, Mark — Appairent Technologie

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

Maturity of Technology: For example, the subsystem shown in slide 18 of the multiband OFDM proposal will be quite difficult to implement due in part to the number and proximity of SSB mixers.

SuggestedRemedy

In general, a Much more detailed disclosure about the specific implementation and the IC technologies of both the receiver and the transmitter must be provided to prove that it can be implemented in the time declared.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **162**

Shvodian, Bill — XtremeSpectrum, Inc.

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

Time to Market. The MBOA proposal does not have acceptable time to market. Technology that can economically be built today in volume is required.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **169**

Siwiak, Kai — Independent

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

Maturity of solution: it is a Theory/Practice issue: "Practice is when everything works but no one knows why; Theory is when we know everything but nothing works." At the moment the MB-OFDM coalition proposal is a freight train riding down a track that is a blend of Theory and Practice: potentially, nothing works and no one knows why. The MB coalition proposals had been on an acceptable impulse radio path that had proven aspects. They've abandoned the approaches to embrace what I believe to be a research project; whereas the only demonstrated UWB approaches have been impulse radio solution.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **167**

Siwiak, Kai — Independent

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

Maturity of solution: it is a Theory/Practice issue: "Practice is when everything works but no one knows why; Theory is when we know everything but nothing works." At the moment the MB-OFDM coalition proposal is a freight train riding down a track that is a blend of Theory and Practice: potentially, nothing works and no one knows why. The MB coalition proposals had been on an acceptable impulse radio path that had proven aspects. They've abandoned the approaches to embrace what I believe to be a research project; whereas the only demonstrated UWB approaches have been impulse radio solution.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **172**

Virk, Bhupender — Independent

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

This committee has more work to do. The PAR specifies that the approved instantiation should be implementable. It is obvious from the presentations to date that the OFDM proposal is mostly analysis and in some cases, perhaps even PowerPoint. Power consumption numbers are based seemingly wholly on analysis rather than actual silicon. On the other hand, XSI has demonstrated a working solution at the chip level which appears to meet regulatory requirements and the PAR. Therefore I need to see this committee push with further steps toward hardware.

SuggestedRemedy

I may be able to change my position once the OFDM approach has progressed much closer to practice.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **174**

Wang, Jerry — XtremeSpectrum, Inc.

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

Time To Market (TTM). I do NOT have confidence that the Multiband-OFDM proposal will expeditiously execute the project deliverables i.e., the DRAFT standard will be delayed relative to the ParthusCeva/XSI Proposal. Specifically, the Multiband-OFDM proposal - 03/267r5, slide 36 indicates "Time to market: the earliest complete CMOS PHY solutions would be ready for integration is 2005." The alternative ParthusCeva/XSI Proposal indicated "Time to market Silicon in 2003".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL CAN DEMONSTRABLY SHOW EQUIVALENT TTM RELATIVE TO THE XSI/PARTHUS CEVA PROPOSAL.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **176**

Wang, Jing — JWA Consulting, LLP

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

The technical feasibility and thoroughness of the MB-OFDM proposal are not convinced.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **185**

Wilson, Richard — Independent

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

Time To Market (TTM). Simultaneous Operating Piconets (SOP), PER THE 802.15.3a PAR. I do NOT have confidence that the MOFDM proposal fully understands the recent contribution -0/276r0 from a few of our members on the issue of "Consumer Electronic Requirements for TG3a". Specifically, the alliance proposal will initially provide for only three (3) SOP vs. their requirement "...Number of overlapping SOP: Absolute minimum: 4, Target: 8+" the alternative ParthusCeva/XSI Proposal indicated "Operation with up to 8 simultaneous piconets".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE PROPOSAL IS REVISED TO TECHNICALLY SUPPORT A MINIMUM OF FOUR (4) SOPs.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **184**

Wilson, Richard — Independent

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

Time To Market (TTM). I do NOT have confidence that the MOFDM proposal will expeditiously execute the project deliverables i.e., the DRAFT standard will be delayed relative to the ParthusCeva/XSI Proposal. Specifically, the MBOFDM proposal -03/267r5, slide 36 indicates "Time to market: the earliest complete CMOS PHY solutions would be ready for integration is 2005." The alternative ParthusCeva/XSI Proposal indicated "Time to market Silicon in 2003".

SuggestedRemedy

I WILL CONSIDER CHANGING MY NO TO A YES IF THE MOFDM PRODUCTS ARE AVAILABLE IN 2004.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **171**

Takaoka, Katsumi — JVC

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

The following is the reason for NO vote. I can't decide which technology is better at this point for consumer electronic products.

SuggestedRemedy

I need more time for analysis.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # **178**

Watanabe, Fujio — DoCoMo USA Labs

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

I cannot decide which technology is better at this moment.

SuggestedRemedy

I need more time to consider.

Proposed Response *Response Status* **O**