**IEEE P802.15 Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title |  | |
| Date Submitted | [Jan 2012] | |
| Source | [Pat Kinney, Betty Zhao] [] [address] | Voice: [ ] Fax: [ ] E-mail: [ ] |
| Re: | [Task Group 802.15.4k Interim Session in Jacksonville] | |
| Abstract | [Task Group 802.15.4k Minutes] | |
| Purpose | [Official Minutes of the Task Group Session] | |
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# AM2, Monday, 16 January, 2012

10:36 Call to order

Chair presented TG4k opening report 15-12-021-00. Chair reminded attendees that highlights of the IEEE-SA Standards Board Bylaws on Patents in Standards. Chair referred those who wished to review these policies that the IEEE-SA patent policy presentation slides 0-5 and reading the instructions for the WG Chair.([http://standards.ieee.org/board/pat/pat-slideset.ppt](https://imail.huawei.com/owa/redir.aspx?C=82b590c9b9b84271bfdefae08fb18358&URL=http%3a%2f%2fstandards.ieee.org%2fboard%2fpat%2fpat-slideset.ppt" \t "_blank)).  Chair asked participants to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) that the participant believes may be essential for the use of that standard, there were no responses.  Chair reminded participants of anti-trust rules and obligations.

Approve/modify agenda (15-11-0859-02-0000)

Moved by Seong-Soon Joo, seconded by Clint Powell. Following neither discussion nor objection the agenda was approved.

Review and approve TG4k minutes from the Atlanta session (15-11-0716-00-0000)

Moved by Seong-Soon Joo, seconded by Matt Johnson. Upon neither discussion nor objection the joint minutes were approved.

Sub-Group status updates:

* DSSS by David Howard
  + working on draft text
  + areas TBD include Preamble, Sync header, PHY header, coding, interference mitigation
* FSK by Matt Johnson
  + posted draft
  + discussing parameters such as SFD length
* MAC by Ben Rolfe
  + working on draft text
  + folding in inputs from various people for review on Tuesday PM1

Terminology:

* stateless: no additional information is needed to properly receive and decode a frame other than the current standard
* stateful: pre-existing information is needed to properly receive and decode a frame, this pre-existing information must be shared between the sender and receiver.
* energy harvesting: ability to derive energy from the device's environment, beyond using a mains supply
* commission: to configure a device for proper operation in a specific network and application.
* dormant/hibernating: non-operating device state to conserve energy
* idle/standby: operating device state that is neither receiving nor transmitting nor preparing to receive or transmit
* hot spare coordinator: device that can assume coordinator role for a network in the event that the primary coordinator is not available

12:02 chair recessed until PM1

# PM1, Monday, 16 January, 2012

13:45 call to order

DSSS presentation on proposed draft text (15-11-0863-02)

* Data rates (1 Mc/s): Low - 10 kb/s, High - 31 kb/s
* Process Gain: ~8,000 chips/bit, not coherent
* pulse shape spec vs. spectral power mask?  TG4g used spectral power mask
* timebase accuracy concerns for long codes
  + specify timebase accuracy?
  + doppler?

14:30 Interference Mitigation for TG4k networks (15-12-031-00) by Prof Kyung Sup Kwak

14:43 chair recessed until PM2

# PM2, Monday, 16 January, 2012

16:01 call to order

DSSS discussion:

* Systematic convolutional encoding
* 14.3.3.2 diagram works but text changes are needed for the ½ rate coder
* channel bands and chipping rates
  + 2.4 GHz - David Howard
  + 433 MHz - Cristina Seibert

# AM1, Tuesday, January 17, 2012

08:17 Chair called meeting to order

Doc. 864-03 by Matt Johnson, discussion on FSK preliminary draft

* Discussion about the different length of preamble for different situations, the values of phyLECIMFSKPreambleLength is suggested in “bit”.
* PHR …?
* Data whitening (figure 3) is optional
* Channel hopping (figure 3) is subject to regional regulation
* Suggest adding more information in 17.1.2.6 spreading block, such as code, rate, etc.
* Suggest reconsidering the value of T of 2450MHz in 17.1.4.3
* Discussion on the value of receiver sensitivity, and suggest taking out “shall” from 17.1.4.6
* Discussion on the value of transmit power, and suggest taking out the second sentence of 17.1.4.10

Doc. 030-00 by Cristina Seibert

* Discussion on the consistence of different countries of 433MHz
* Some concerns on 100kHz channel spacing (slide 5) on 2.4G/20ppm or Japan/Korea, while 200kHz may be ok anywhere.
* Q: Slide 8, why we need those unsupported modes. Asymmetric link can keep the spirit of 4k. A: PHY should be general, so it’s not excluded.
* Q: Slide 9, for MAC fragmentation, can we have a shorter SFD? A: Yes.

10:02 Recess

# AM2, Tuesday, January 17, 2012

10:37 Chair called meeting to order

Doc. 014-02 by Steve Jillings

This presentation is aiding TG to write the draft.

* Discussion on function and length of SFD and preamble (slide 20)
* Discussion on CCA and LBT (slide 21)

Matt Johnson leads the discussion on FSK text.

* Whether to have symmetric link in 4k by referring to doc. 602-00
* Regulation of 433MHz

12:05 Recess

# PM1, Tuesday, January 17, 2012

13:38 Chair called meeting to order

Ben Rolfe reviews the MAC draft 828-01.

* Q: Does 6LoWPAN have fragmentation and how does it fit into 4k? A: 6LoWPAN is on the top of 4k fragmentation, they’re complementary. It makes retransmission more reliable in low energy network.
* Q: Is it a mechanism to send the prioritized message during the fragment transmission? A: Pat’s presentation has a mechanism to terminate the fragment sequence. It’s the function for coordinator handling multiple sequences not for end device.
* Q: Coordinator has capability receiving multiple streams (multiple PN codes)? A: It will affect CCA, and more of an implementation issue.
* Q: How many priority levels and what sets priority? A: two, upper layer.
* Explanation the difference between I-RIT and CSL
* Suggest removing the second paragraph of 5.1.11.4.2 because it’s only about higher layer.

Doc. 040-00 by Seong-Soon Joo

No questions

15:05 Recess

# PM2, Tuesday, January 17, 2012

16:00 Chair called meeting to order

Doc. 027-01 by Ameen

* Q: In DSSS, energy of signal is lower than noise, can’t just use energy detect to judge whether received wakeup packet, and if the wakeup radio want to capture and synchronize the wakeup packet, the consumption cannot be as low as we need in 4k. A: The wakeup radio doesn’t work that way, the proposer explains slide 23.
* Q: Kind of adding a PHY? A: Yes, but it doesn’t specify the parameters.
* It’s difficult in term of low power MCU. What’s the difference with RFID? How to solve interoperability? What does the wakeup signal look like?
* It can be option as network management mechanism.
* C: It’s not necessary that all the receivers are on at the same time, it’s kind of a burden considering power consumption, regulation, complexity, etc. And it’s a valid proposal but not easy for standardization.

Discussion on the length and fields of fragment packet and its overhead

* Depends on PHY, FSK and DSSS have different length, referring to doc. 861-03

18:00 Recess

# PM1, Wednesday, January 18, 2012

13:40 Chair called meeting to order

Pat leads the discussion of “4. General description”

* Add CLON topology to “4.3 Network topologies”
* No change for “4.4.1 Physical layer”
* Fragmentation and priority channel access are added to “4.4.2 MAC sublayer”
* Different superframe structures are added to “4.5.1 Superframe structure”

Pat leads the discussion of “Annex” and the revised document is to post as doc. 044-00. People having information to add can submit by email.

* Delete “Monitoring” definition
* Add “widely dispersed devices” to “Long range” bullet
* Add “coverage extension” to “LECIM behaviors”
* Discuss and change the format of “LECIM behaviors” section

Pat leads the discussion of Coexistence document

* Qing Li volunteers to be in charge of writing coexistence document.

Chair reviewed objective for changes to Clause 4 - General Description

Chair advised group that he will obtain a roll-up of Clause 4 (i.e. TG4e, TG4g) to better understand what changes are needed

Chair reviewed preliminary draft for informative annex (15-12-044-00)

15:01 chair recessed until PM2

# PM2, Wednesday, January 18, 2012

16:02 call to order

 Interference Mitigation for TG4k networks (15-12-058-00) by Prof Kyung Sup Kwak

FSK, DSSS, and MAC subgroups split off to draft text.

17:30 recess

# AM1, Thursday, January 19, 2012

8:15 Chair called meeting to order

Technical editor decision

* Monica Brown has volunteered to be editor: to confirm Monica as the editor, Ben moved, David seconded, motion carries
* Coexistence document is edited by Qing Li.

Discussion on status and path forward of DSSS, FSK and MAC.

8:37 Recess

# AM2, Thursday, January 19, 2012

10:42 Chair called meeting to order

Path forward of FSK draft

* Assignments of investigating proposed bands:
* 169MHz & 433MHz: Cristina Seibert
* 400-470MHz (Korea): Ameen
* Chinese band: Steve

Path forward of DSSS draft

* Working on interleaving
* Still need information of chip rate and Chinese channelization

Path forward of MAC draft

* Discussion on parameters of fragment frame, and the document will be posted as 861-02
* The method to differentiate fragments and non-fragment critical messages sent during fragments transmission

12:01 Recess

# PM2, Thursday, January 19, 2012

13:46 Chair called meeting to order

David Howard went through the updated LECIM DSSS draft text 863-03.

Finished closing report doc. 066-00

Ben reviewed MAC working draft 882-02.

14:45 Adjourn