WirelessHUMAN™ Study Group Chair Report to IEEE 802.11/802.15 Joint Interim Meeting, 8 May 2000

Venue:

8 May 2000: IEEE 802.11/802.15 meeting (8-12 May 2000 in Seattle, WA, USA)

Purpose:

Introduce WirelessHUMAN™ Study Group to IEEE 802.11/802.15 and get feedback on potential synergies.

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Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <mailto:r.b.marks@ieee.org> as early as possible, in written or electronic form, of any patents (granted or under application) that may cover technology that is under consideration by or has been approved by IEEE 802.16. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/letters>.

Joint 802.11/802.15/WirelessHUMAN™ Meeting Agenda

- 6:30 - 6:45 Introductions
- 6:45 - 7:15 Report on WirelessHUMAN Study Group
- 7:15 - 7:45 Input from 802.11
  - PHY
  - MAC
- 7:45 - 8:15 Input from 802.15
  - PHY
  - MAC
- 8:15 onwards Joint Discussion

WirelessHUMAN™
(High-speed Unlicensed Metropolitan Area Network)
IEEE 802.16 Study Group

Durga P. Satapathy - Chair
Sanjay Moghe - Secretary

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Sanjay Moghe - Secretary

Report at Joint 802.11/802.15 Interim Plenary Meeting
8th May, 2000 Seattle

WirelessHUMAN™ Background

- The IEEE 802.16 WirelessHUMAN Study Group was approved at the March IEEE 802 Plenary meeting

- Significant interest from both academia and industry (manufacturers and service providers)

- First meeting held at IEEE 802.16 Session 7 with over 30 participants

What's Different About WirelessHUMAN^{TM}?

- IEEE 802.11 – optimized for LANs primarily using ISM bands requiring spread-spectrum

- IEEE 802.15 - optimized for PANs (relatively small range) and focused on ISM bands

- IEEE 802.16.3 – optimized for MANs in licensed bands from 2 to 11 GHz

- WirelessHUMAN Study Group will address MANs in license exempt bands.

WirelessHUMAN™ Objectives

- Identify license exempt bands that can best serve the wireless industry need for fixed broadband MAN access with a focus on 5-6 GHz bands

- Investigate issues in developing an Air Interface Standard for the identified bands

- Investigate feasibility of using elements from existing standardization efforts e.g. IEEE 802.15, 802.11 PHY & Enhanced MAC, IEEE 802.16.3 PHY & MAC etc. or modifications thereof

- Joint meetings with 802.16.3, 802.11, 802.15 and other standards groups

Proposed Activities

- Perform study

- Develop draft PAR

- Open ballot process to facilitate participation from other groups (e.g. IEEE 802.11)

- Joint interim meetings with IEEE 802.11/802.15 to investigate synergies.

- Obtain recommendations on interactions with 802.11, 802.15 and 802.16 on issues relevant to license exempt bands.

- Investigate potential to reuse standardization efforts from 802.11/802.15/802.16

Key Elements of the WirelessHUMAN™ Specification Efforts

- This intended standard will specify the physical layer and media access control layer of the air interface of interoperable fixed point-to-multipoint broadband wireless access systems.

- The specification will enable public metropolitan area network access to connection-oriented and/or connectionless data, video, and voice services.

- The specification will apply to systems primarily operating in license exempt bands for outdoor use between 5 and 6 GHz

Existing Support for Active Participation

• Durga P. Satapathy	Sprint (**Chair**)
• Sanjay Moghe	RF Solutions (**Secretary**)
• Amarpal Khanna	Agilent Technologies
• Demos Kostas	Adaptive Broadband
• Valentine Rhodes	Intel
• Mika Kasslin	Nokia
• David Trinkwon	Transcomm Inc.
• Marianna Goldhammer	Breezecom
• Naftali Chayat	Breezecom
• Roger Durand	Cabletron
• Avi Freedman	Innowave ECI
• Dean Chang	BNA Systems
• Amos Dotam	WaveIP
• Hadad Zion	Runcom
• Michael Stewart	Escape
• Stanley A. Reible	Micrilor, Inc.

Existing Support for Active Participation

- Chris Paulowski   Wireless Home
- Vijaya Gallagher   Wireless Home
- Jon M. Peha   Carnegie Mellon University
- Panos I. Dallas   Intracom
- Gordon Stuber   Georgia Institute of Technology
- Hossein Izanpanah   HRL Laboratories, LLC
- Anader Benyamin-Seeyar   Harris Corporation
- Chao-Chun Wang   Malibu Networks
- Inchul Kang   Malibu Networks
- Stan Rieble   Proxim
- Jehuda Hakcai   Ultracom
- Leif Jansson   Ericsson
- Chaim Shenhan   N Band Com
- Hossein Izadpanh   HRL Labs
- Roger Durand   Cabletron systems
- David Sumi   Wireless Inc.
- E. Doherty   Coreon Inc

Key Issues

- What are the existing regulations in the various unlicensed bands, and what unlicensed bands may be appropriate for WirelessHUMAN systems?

- What mechanisms for interference avoidance/suppression, resource sharing, and ensuring adequate performance exist in unlicensed bands?

- What are the unique system design issues/requirements of WirelessHUMAN systems from a MAC/PHY layer perspective? What elements can we utilize from existing work?

- Should the Study Group write a PAR to proceed with a standard? If so, should we try for July or wait until November?

WIRELESSHUMAN AGENDA

Date	Time	
2-May	8:00	Joint meeting 802.16.3 & WHUMAN SG
		Introductions and member sign up
		Review of Goals and Objectives
		Discussion and Acceptance of Agendas
	10:00	Discussion of Key Issues (Chair)
	10:15	Study Group Operating Procedures (Secretary)
	11:00	The Path Towards Efficient Coexistence in Unlicensed Spectrum
		- 802.16hc-00/03 Contribution from Jon Peha
	12:30	Lunch Break
	1:30	Joint Session with 802.16.3
3-May	8:00	Joint Session with 802.16.3
	12:30	Lunch
	1:30	Requirements for WirelessHUMAN Systems
		- 802.16hc-00/01 Contribution from Mika Kasslin a
	2:30	Requirements for Broadband Wireless Access systems in the UNII bands
		- 802.16hc-00/02 Contribution from Vijaya Gallager
	3:30	Break
	3:45	Discuss CEPT Proposal
	4:15	Discuss Report to 802.11/802.15
	5:30	Dinner Break
4-May		
	8:00	802.16hc-00/04 Overview of UNII Regulations
		Contribution from Jamie Cornelius
	9:00	Discussion of WirelessHUMAN Milestones & PAR
	12:00	Lunch Break

WirelessHUMAN™ System Characteristics

- Metropolitan Area Network
  - Need for Point-To-Multipoint Systems
  - Typically cellular; sectorized with frequency reuse
  - Typically needs backhaul architectures capable of reliable broadband transport
  - Connectivity to wired infrastructure/ core networks
- Services: voice, video & data
- Fixed/Nomadic Wireless Service Provider Application
- Operate in Unlicensed Frequency Bands (initial focus on outdoor UNII bands)
- Operation in presence of other unlicensed devices
- MAC/PHY efficiency to support MAN environment
- Cost and performance for residential/SOHO/SME/ customers
- QoS support (in-system & external interference)

Impact of 802.11/802.15

- Existing Common Elements
  - Operation in Unlicensed Spectrum
  - Growing interest from service providers/carriers

- Key Elements Needed
  - Mechanisms to avoid/suppress interference
  - Design input on multipath, equalization, modulation (e.g. OFDM; adaptive techniques), FEC/ARQ etc.
  - Co-existence criteria
  - QoS support

Key Input

- 802.11 and 802.15 Tutorials/Conference Calls

- Contributions on elements of 802.11/802.15 MAC/PHY standardization efforts that would be applicable to WirelessHUMAN

- Present above findings at July meeting