

## Tentative Minutes of the IEEE P802.11

### Full Working Group Plenary Meeting Irvine, CA

9 to 13 March 1998

Monday, 9 March 1998

**1.0 Opening** Meeting called to order by Vic Hayes at 14:30, Agenda of 45rd session of 802.11 is in doc.:IEEE P802.11 11-98/66r1. Al Petrick acting, secretary for George Fishel <sup>1)</sup> is present and ready to take the notes.

### Objectives for this meeting, all groups

- 1.1 Review and presentation of Technical Submissions
- 1.2 Review or elect officers for 802.11
- 1.3 Review results of ballots on 802.11rev/D2 and 802.11c/D2
- 1.4 Submit 802.11rev and 802.11c to Sponsor ballot
- 1.5 Start selection process as defined in document 98/54
- 1.6 Consider PAR process for Wearable computer communication

<sup>1)T</sup> The officers of the Working Group are:

**Mr. VICTOR HAYES**  
Chairman IEEE P802.11  
Lucent Technologies  
Phone: +31 30 609 7528  
Fax: +31 30 609 7498  
E-Mail: v.hayes@ieee.org

**Mr. GEORGE FISHEL**  
Secretary IEEE P802.11  
AMP Inc.  
Phone: +1 717 592 6161  
Fax: +1 717 592 6179  
E-Mail: grfishel@amp.com

**Mr. BOB O'HARA**  
Editor IEEE P802.11  
Informed Technologies Inc.  
Phone: +1212 645 4317  
Fax: +1 212 645 6719  
E-Mail: bob\_ohara@informed-technologies.com

**Mr. STUART KERRY**  
Vice-Chairman IEEE P802.11  
Butterfly Communications, Inc.  
Phone: +1 408 496 6868  
Fax: +1 408 496 0909  
E-Mail: stuartk@butterfly.com

**Mr. AL PETRICK**  
Vice-Chairman IEEE802.11  
Harris Semiconductor  
Phone: +1 407 729-4944  
Fax: +1 407 724-7886  
E-Mail: apetrick@harris.com

**Mr. JOHN FAKATELIS**  
Chair IEEE802.11-TGb  
Harris Semiconductor  
Phone: +1 407 729 4733  
Fax: +1 407 724 7886  
E-Mail: Jfakat01s@harris.com

**Mr. DAVE BAGBY**  
Chair IEEE P802.11-MAC group  
Advanced Micro Devices  
Phone: +1 408 987 2423  
Fax: +1 408 987 2800  
E-Mail: david.bagby@amd.com

**Mr. DEAN KAWAGUCHI**  
Chair IEEE P802.11-PHY group  
Symbol Technologies Inc.  
Phone: +1 408 369 2629  
Fax: +1 408 369 2740  
E-Mail: deank@psd.symbol.com

**Mr. NAFTALI CHAYAT**  
Chair IEEE802.11-TGa  
BreezeCom, Inc.  
Phone: +972 3 645 6262  
Fax: +72 3 645 6290  
E-Mail: naftalic@breezecom.co.il

**1.1 Roll Call:** People in the room were invited to introduce themselves. There were 56 people in the room.

**1.2 Voting rights:**

1.2.1 Participation in debates, moving and seconding is only permitted by voting members, in all 802.11 meetings (at all levels). The subgroup chairs may permit observers to participate in debates.

1.2.2 Voting at the working group level is by voting members only. Chair may permit observers to participate in debate. To become a voting member:

1.2.2.1 Participate in at least 2 out of 4 consecutive plenary meetings. Voting rights start at third meeting

1.2.2.2 Participation in at least 75% in meetings, in the room

- One interim may be exchanged for a plenary

- Voting members will get a token to be used at votes

1.2.2.3 All members have voting rights at task group meetings

1.2.3 Voting rights can be maintained:

1.2.3.1 By participation in 2 plenary meetings within 4 consecutive plenary meetings

1.2.3.2 One interim may be substituted for a plenary

1.2.4 Voting rights may be lost:

1.2.4.1 After failing to pay the conference fee

- After missing two out of three consecutive letter ballots

- Currently 5 voters lost their voting rights, (**Please see Vic Hayes for reinstatement of voting privileges**)

1.2.5 Current state of member status:

1.2.5.1 Voting members (57)

1.2.5.2 Aspiring voting members (32)

1.2.5.3 Nearly voting members (45)

**1.3 Attendance List, Registration**

**1.3.1 Administration:** The attendance list was circulated, Chris Zegelin supervising - 75% attendance according to the attendance list is required to qualify for participating in the meeting as a whole, so make sure to sign the book. Copies of the attendance list are handed out before the end of each meeting.

1.3.1.1 Important for administration of voting rights that the attendance book is used properly.

1.3.1.2 Sign per meeting (morning, afternoon, evening). Do not sign ahead.

1.3.1.3 Place initials. Do not cross or underline. You must attend the session after signing.

1.3.1.4 Circle the letter corresponding to the meeting you attend when signing (F=full 802.11, P=PHY, M=MAC group).

**1.3.2 Registration:** You pay full plenary costs if you attend more than ½ hour of any meetings for the week.

**1.3.3 Check E-mail addresses in the book:**

1.3.3.1 Some addresses have been struck, or have a \$-sign added to the right - those received complaints from the reflector

1.3.3.2 Please strike your e-mail address if you do not use it. If you do not disagree to receiving very long files, mark bulk e-mail with YES.

**1.4 Logistics:** Paper document distribution is done using pigeon holes. Paper distribution is only for those members not having a PC. You will find your copies and messages in the referenced location in the expanding file folders in the slot *in front of* your name. Electronic distribution is also available.

1.4.1 Conference fee to be paid through IEEE802 registration office at the hotel.

1.4.2 Copying and collection of files is managed by Stuart Kerry. Al Petrick assists in pigeonhole stuffing. Stuart is also in charge of document numbers. Before a submission is presented, a document number must be assigned by Stuart and a file copy on diskette in Office 95 submitted using the 802.11 templates for record and distribution. Each submitter must provide twenty-five (25) paper copies for pigeon hole distribution.

1.4.3 Coffee breaks at 10 AM and 3 PM. Noon to 1:00 PM lunch, printing is available in the hotel 802.11 office.

1.4.4 Document distribution: The primary dissemination of documentation is electronic file distribution. However three (3) mediums will be used. They are: a) 802.11 network b) flash memory card, c) diskettes. Approximately twenty 20% of the attendees can apply for receiving paper copies.

1.4.5 Sign in for a slot, remember the letter and number (this is for members not having electronic access. Pigeon holes are file folders with a letter id on each folder and a number on each slot in each folder are numbered slots, each of which is 'owned' by a person. Each person owns slot in front of number.

**1.5 IEEE Patent Policy** Vic Hayes explained the IEEE Patent Policy as per Clause 5 of the IEEE Standards By-Laws and per Clause 6.3 of the IEEE Standards Operations Manual. He specifically asked for notification from members of patents applicable to the Published standards or draft standard and that patent holders submit the requested statement.

## 1.6 Other announcements

1.6.1 General information is available on the file server.

1.6.2 Volunteers needed for the mailing: The 3 volunteers are: Harry Worstell, Naftali Chayat, Ian Gifford.

1.6.3 Distribution of the standard will be available on Wednesday: currently only voting members.

1.6.4 Availability of projectors for 802.11 (3-projectors are available for the meeting sessions).

1.6.5 Tutorial on editing of the standard. It will be held Tuesday from 8:30PM to 9:30PM.

1.6.6 On site registration will be USD300 and USD275 for pre-registration.

1.6.7 High rate of laptop theft from meeting rooms, doesn't appear to be a problem in the hotel rooms.

## 2. Approval of the minutes of previous meetings

2.1 Minutes of the Lynnwood, Washington meeting approved 11-98/45. No comments on the minutes.

**Motion 1: To approve the minutes, John Fakatselis moves to approve minutes, Seconded by Stuart Kerry, motion passes 39-0-0.**

2.2 There were NO matters rising from the minutes.

### 3. Reports

3.1 Letter ballot passed, update given by Vic Hayes.

3.2 The ExCom meeting update.

- Secret ballots in 802.11 was expressed, legal ramifications will be studied by an IEEE legal staff liason. The ExCom agreed for 802.11 to continue with secret ballot until notified otherwise.
- The ExCom reviewed Wearables Networking tutorial and agreed for 802.11 to make PAR recommendations.

4. **Review of Contributions:** The list of document submissions were reviewed from 98/109 to 98/118.

### 5. Adoption of Agenda

Vic Hayes reviewed the agenda and proposed additions to the published agenda. Additions are:

- 6.0 Unfinished business
- 6.1 TGa
- 6.2 TGb
- 6.3 802.11c
- 6.4 802.11rev
- 7.0 New business
- 7.1 Reconfirmation/election of 802.11 officers
- 7.2 Wearable computer communications
- 7.3 PAR for guidelines for 802.11 devices approval requirement.

5.1 No proposal for new agenda items

**Motion 2: To approve adoption of agenda, Kent Rollins moves to approve, Seconded by Harry Worstell, motion passes 39-0-0.**

### 6. Unfinished Business

- TGa - update given by Chair Naftali Chayt.
- TGa - NEC-BreezeCom agreed to present a PHY joint-proposal.
- TGa - Micrilor agreed to redrawn their 5.0GHz PHY proposal.
- TGb - agreed to an agenda for the week
- TGb - started review of technical proposals
- TGb - has seven proposals for review for the week
- TGb - Chair John Fakatselis requested assistance from the Chair for secret balloting procededures.
- TG rev update given by Bob O'Hara (only editorial issues at this point)

### 7. New business

#### 7.1 Reconfirmation /election of 802.11 officers

- **Motion 3: To nominate Bob O'Hara as chair of 802.11 TG rev, moved by John Fakatselis, Seconded by Naftali Chayat. Having no further nominations, Bob was elected by acclamation.**
- **Motion 4: To nominate Victoria Poncini as chair of 802.11 TGc, moved by Roy Sebring, Seconded by Stuart Kerry. Having no further nominations, Bob was elected by acclamation.**
- **Motion 5: To nominate John Fakatselis as chair of 802.11 TBb, moved by Harry Worstell, Seconded by Dean Kawaguchi. Having no further nominations, Bob was elected by acclamation.**
- **Motion 6: To nominate Naftali Chayat as chair of 802.11 TBa, moved by Carl Andren, Seconded by John Fakatselis. Having no further nominations, Bob was elected by acclamation.**
- **Motion 7: To noiminate Dean Kawaguchi as 802.11 PHY chair, moved by Carl Andren, Seconded by John Fakatselis. Having no further nominations, Bob was elected by acclamation.**
- **Motion 8: To nominate Dave Bagby as 802.11 MAC chair, moved by Stuart Kerry, Seconded by Al Petrick. Having no further nominations, Bob was elected by acclamation.**
- **Motion 9: To nominate George Fishel as 802.11 Secretary, moved by Cherry Tom, Seconded by Dean Kawaguchi. Having no further nominations, Bob was elected by acclamation.**

- **Motion 10: To nominate Al Petrick as 802.11 Co-Vice-Chair, moved by Stuart Kerry, Seconded by John Fakatselis. Having no further nominations, Bob was elected by acclamation.**
- **Motion 11: To nominate Stuart Kerry as 802.11 Vice-Chair, moved by DuaneHurne, Seconded by Al Petrick. Having no further nominations, Bob was elected by acclamation.**

Vic Hayes asked Stuart to take the chair, Stuart taking the chair.

- **Motion 12: To nominate Vic Hayes a 802.11 Chairman, moved by John Fakatselis, Seconded by Jan Boer. Having no further nominations, Bob was elected by acclamation.**

Stuart returned the chair to Vic.

**These officers will be presented to ExCom and posted on the IEEE802 home page: homepage <http://grouper.ieee.org/groups/802/11>**

**7.2 Wearables networks:** Bob Heile presented an brief overview of Wearable computer communications, and their position relative to Personal Area Networking.

**Motion 13: To establish an ad-hoc group to look at the requirements of Personal Area Networking, and , if warranted, prepare a recommendation and motion for the 802.11 Plenary on Wednesday, March 11, 1998 to form a PAN Study Group with the charter of drafting a PAR for presentation at the next Plenary of 802, moved by Bob Heile, Seconded by Stuart Kerry, motion passes 34-1-6.**

**7.3 PAR for guidelines for 802.11 devices approval requirement:**

**8. Meeting adjourned for the day by Vic Hayes at 4:30PM.** Breakout into Task groups Tba and TBb as illustrated in graphic outline.

### Wednesday 11, March 1998 Plenary, 1:00PM

**9. Opening:** Plenary session opened by Vic Hayes at 1:00 with introductions. There were 78 people in attendance. Al Petrick is the acting secretary for this session and ready to take notes.

9.1 Roll Call:

9.2 Documentation list update: Documents 98/140, 98/141, were reserved for RadioLAN addressed by Stuart K.

9.3 Agenda update: TGb chair requested that the group needed additional time to complete the proposal review. TGb planned to meet until 6:30PM. Tga was removed from the Wednesday evenings agenda.

**Motion 14: to move the agenda as modified, moved by Wim Diestraten, Seconded by Harry Worstel. No further discussion. Motion passes 36-0-3.**

9.4 Announcements

9.4.1 Calendar year 2000 hotel selection

Selection for July 9-14, 2000 802 plenary meeting place

- 1) Sheraton West Palm Beach - West Palm Beach Florida, \$75/night
- 2) Double Tree Hotel, Seattle Airport - Seattle, WA, \$140/night
- 3) Hyatt Regency Vancouver - Vancouver, BC Canada, \$149/165/night
- 4) Hyatt Regency La Jolla, LaJolla, CA, \$149/night
- 5) The Portland Hilton, Portland, OR, \$187/night
- 6) Portland Marriott Downtown, Portland, OR, \$169/night
- 7) Grand Hyatt New York, NY, \$175/night
- 8) Seattle Westin Hotel, Seattle, WA \$189/night
- 9) Sheraton Seattle Hotel & Towers, Seattle WA, \$190/night
- 10) Hyatt Regency Hilton Head Resort - Hilton Head, SC, \$195/night

- Selection for November 5-10, 2000 hotel plenary meeting place
- 11) Hyatt Regency Vancouver - Vancouver BC CA, \$125/night
  - 12) Sheraton West Palm beach, West Palm beach FL, \$85/night
  - 13) Radisson Hotel & Conference Ctr, Baton Rouge, LA \$92/night
  - 14) Baton Rouge Hilton-Baton Rouge, LA, \$95/night
  - 15) Hyatt Regency Miami, Miami FL \$145/night
  - 16) Hyatt Regency Tampa, Tampa Florida, \$145/night
  - 17) Hyatt Regency Bellevue, Bellevue, WA, \$165/night
  - 18) Hyatt Regency New Orleans, New Orleans, LA, \$178/night

A tally sheet list of a straw poll was generated for submission to the ExCom plenary. Jim Carlo 802 chairman proposed \$225/night for European meetings. A straw poll was taken to go to Europe for plenary, Straw indicated 60-12 go/nogo.

9.4.2 Projectors: Jim Carlo, 802 chairman gave an update on XGA Projector Ballot, reference document 802.0/25 February 1998. Also covered was the policy for future plenary registration fees, \$275 for pre-registration and \$300 for on-site. Also covered was a strategy to save costs in for registration

9.4.3 Documentation distribution evaluation: Darwin Engwer, will be making an evaluation of the WLAN server network. Stuart Kerry noted that some of the document files were receive by the submitters as corrupt. It was encouraged that other OEMs bring APs to add to the server. Darwin indicated that there were 3 ports available for APs.

#### 10. Old Business

10.1 Report from TGc 802.11c summary report given by Bob OHara referring to document 802.11-98/124.

**Motion 15: to forward, 802.11c/d4 to sponsor ballot, moved by Bob O'Hara, Seconded by Keith Amundsen.**

**Discussion: Bob O'Hara confirmed no technical issues.**

**No further discussion. Motion passes; 40-0-1**

10.2 Report from 802.11rev.: Bob O'Hara gave a report reference to 802.11-98/125. Bob would like to close the existing NO vote sometime this week. The new document will be 802.11revD3 with all changes accepted. Bob wants to resolve the NO vote before bringing a motion for letter ballot to plenary.

10.3 Ad-hoc WPANs: Ian Gifford and Robert Heile, presented an update report as covered in document 802.11-98-135. April 8<sup>th</sup> in Cambridge Mass will be the first ad-hoc meeting. The study group is an open forum to all who are interested.

**Motion 16: to adopt and form a study group for WPANs, moved by Robert Heile, Seconded by Stuart Kerry.**

**Discussion: Clarification on minimum data rate for 802.11 and purpose of PAR. Some concerns how the HRFWG plays with this motion.**

**No further discussion**

**Votes processed**

**Motion 16 passes 35-0-10.**

#### 11. New Business

11.1 Handling of new proposals: Open discussion to close the acceptance of new proposals updated by John Fakatselis.

**Motion 17: to close the acceptance of new proposals. If 802.11-TGb receives a new request, the requester will be asked provide the documentation specified in the document 97/157-r1 or its update. The task group will assign 45 minutes for presentation and the making of a technical motion. Moved by John Fakatselis, Seconded by Stuart Kerry.**

**Moved to amend by deletion of the first sentence. moved by Naftali Chayat, Seconded by William Roberts.**

Discussion: some disagreement with this motion.

Question called: to amend the motion moved by Dave Bagby, Seconded by Stuart Kerry.

Motion to call the question passes 31-3-10.

Motion to amend fails 4/22/18

**Motion 18: to amend by striking the second part, everything after the first sentence, of the main motion, moved by Dave Bagby, Seconded by Jan Boer.**

**No discussion**

**Votes processed**

**Motion to amend passes 27-2-14**

Dean K asked the of the chair to clarify which task group does this apply to.

Bob Ohara said the PAR applies to both TGA and TGb.

Question called: moved by Dave Bagby, no Second, question abandon.

**Motion 19: to amend the original motion to include TGb moved by Naftali Chayat, Seconded by Dean Kawaguchi.**

**No discussion**

**motion 19 to amend passes by unanimous consent**

**Motion 17 now reads: To close acceptance of new proposals to TGb.**

**Motion 17 Passes: 36-1-9**

11.2 Other new business: Keith Amundsen gave an update on the new venue for Boston in Mass. Raytheon has tentative approve to host a meeting in September. Costs are \$159 for the meeting, weekly billing of \$150/person/wk for food and breaks. Lunches are \$20 per day.

Straw polls were made for alternate meeting sites San Francisco, Boston, was in favor.

End of new business

**13. Adjourn for Subgroups:** Visit schedule for TGa, and TGb meetings.

### Thursday 12, March 1998

**Plenary,  
15:00PM**

**14. Opening:** Plenary session opened by Vic Hayes at 15:00 with introductions. There were 78 people in attendance. Al Petrick is the acting secretary for this session and ready to take notes.

14.1 Announcements: The chair wanted volunteers, to take the positions of the chairs for TGa and TGb, as a temporary position during the final selection proposal process. Jim Carlo expressed his guidance as other 802. Groups ran final selections just like 802.11. It was his recommendation to consider alternate chairs. General discussion on the chairs; both John Fakatselis and Naftali Chayat have been doing a great job, handling the task groups.

14.2 Document list update: presented by Stuart Kerry documents 146, 146r1 and 147 PAN wireless press release draft were the latest updates.

14.3 Adenda Adjustments: add reports from TGa, TGb

No further comments on the agenda, the agenda was adopted with additions.

### **15 Reports from subgroups**

15.1 TGa update: was given by Naftali Chayat TGa chair. TGa failed achieving the objective of selecting the 5GHz proposal. Regulatory issues and insufficient data was presented in the group. The amount of data was inconclusive for the group. The 802.11 chair suggested guidance for getting new data from the proposers. Naftala Chayat requested 5Ghz proposers to come with a new version with data on April 12. The 802.11 Chair suggested that a sub-group of (3) people be formed to generate a set of metrics to assist in the selection process. The sub-group will review the criteria metrics and make a new version for April 1. The sub-group will work informally and come with a new matrix on April 29, just before the opening of the next meeting.

15.2 TGb report, given by John Fakatselis TGb chair. The bulk of the meetings revolved around new general papers and new proposals. Two down selection secret ballots were conducted, governed by document 98/54.

Two motions were present by JohnFakatselis.

**Motion 19a: To accept the results of the groups secret ballot as announced by group TGb. This part of the selection process was step 2 in document 98/54; moved by John Fatatselis, Seconded by Dave Bagby.**

**No discussion on this motion**

**Votes processed**

**Motion 19a passes 38-0-1**

**Motion 20: To accept the results of the groups secret ballot as announced by the TGb. This is part of the selection process was step 7 in document 98/54; moved by John Fakatselis, Seconded by Dean Kawaguchi.**

**This was a technical motion**

**No discussion on the motion.**

**Votes processed.**

**motion 20 passes: 40-0-2**

15.3 TGc Update by Bob O'Hara: 802.11c/D4 problems as described in document 802.11-98/125. The group decided to make editorial changes. A new document was generated 802.11c/D5.

**Motion 21: Having received minor editorial comments from 802.1 on 802.11c/D4 to conduct a 10-day default re-circulation ballot to accept D5 and forward it to the 802 LMSC for sponsor ballot; moved by Bob O'Hara, Seconded by Peter Ecclesine**

**No discussion.**

**Votes processed**

**Motion 21 passes 45-0-1**

Open discussion on the NO voter and his comments. It was noted the NO voter was NOT present for Irvine meetings.

No further discussion.

Straw poll.

How many people agree with the no voter that we cannot make the changes we did.

How many voters disagree with the no voter.

4-23-14 majority disagree with the no voter.

Assuming his vote turns into yes vote.

**Motion 22: to accept 802.11rev/D4 and forward to 802 executive committee for an LMSC sponser ballot, moved by Bob O'Hara, Seconded by Darwin Engwer**

**Discussion:**

**This was a procedural motion**

**Votes processed**

**motion 22 passes 33-1-4**

15.4 WPAN update: Given by Ian Gifford referenced to document 98/147r1/ The groups press release (IEEE launches wearable computer wireless PAN study group.)



**Motion 23: to approve the IEEE WPAN press release as presented, moved by Ian Gifford, Seconded by Stuart Kerry as presented.**

Discussion: Change data rate from less than and equal to 1Mbps. Jim Carlo 802 chair expressed that the IEEE Computer society will re-write the press release. There is no need to dwell on the wording of the submission. John Fakatselis, suggested that a clarification of the study group be added to the press release. The chair suggested that John Fakatselis get together with Ian to edit the submission.

NO further discussion

**It was noted by Stuart Kerry that Ian is not a voter. A non voter cannot make a motion.**

**Bob O'Hara moves on this motion, Seconded by Stuart Kerry.**

**No discussion**

**votes processed**

**Motion 23 passes: 31-0-4**

#### **16. Unfinished Business**

16.1 802.11c/D5 to sponsor via default WF re-circulation

16.2 Next meeting at Lucent reference document 98/70. Objective for next meeting selection of technology TGa and TGb.

**Motion 24: to cancel evening meetings and to conduct parallel sessions of TGa and TGb, moved by Naftali Chayat, Seconded by Tomoki**

Discussion: Some are against a parallel meetings because companies cannot afford sending 2x the people. There are mixed emotions on serial and parallel sessions. The group runs the risk of chaos between meetings especially when voting is going on.

**Motion 25: to amend by removing "to cancel the evening meetings", moved by Jim McDonald, Seconded by Chandos Rypinski.**

**No discussion**

**motion passes: 26-9-5**

**The new motion 24 now reads: to conduct parallel session of TGa and TGb**

Amend the motion: Amend to add: expect on the last and first day of the meetings  
moved by Chandos Rypinski, NO second.  
Therefore no motion to amend.

Request to call the question: by John, Fakatselis, No second

After further discussion:

**Motion 24 fails: 5-33-3**

**Motion 26: That the July meeting includes evening meetings and no parallels TGa and TGb meetings moved by Peter Ecclesine, Seconded by Naftali Chayat.**

**No Discussion**

**motion passes by unanimous consent.**

**Motion 27: amend " to have at the July meeting a Sunday 4P to 10PM and Monday AM intern meeting. Moved by Keith Amundsen, Seconded by Peter Ecclesine**

**No discussion**

**One objection raised. This is a procedural motion**

**votes processed**

**motion 27 passes 15-12-9**

Next Meeting : May 4-8 1998 Utrecht, Netherlands, Lucent to host next meeting. Raytheon to host meeting in September Waltham Mass, the Westin Hotel \$159/night.

**17. New Business;** NO new business

**18. Closure**

Chair extends his appreciation to those for setting up the WLAN server network. The chair encouraged the group to bring WLAN equipment to the May meeting.

Straw poll: 44 people plan to go to Utrecht, Netherlands.

Darwin gave an a electronic update, special thanks to Stuart Kerry and Bob O'Hara, for helping setup the network. The electronic document sharing was well received with minimal problems.

**Adjourn the meeting.**

**Tentative meeting schedule**

<b>Date</b>	<b>Month</b>	<b>Year</b>	<b>Place</b>	<b>Type</b>	<b>Location</b>	<b>Host</b>
8-9	April	1998	Cambridge, MA	Interim, Study Group only	Boston Marriott cambridge	GTE Internetworking
4-8	May	1998	Utrech, the Netherlands	Interim WG +SG	Holiday Inn Utrecht City Center	Lucent Technologies
20-21	May	1998	TBD	Interim Study Group only	TBD	TBD
5-10	Jul	1998	La Jolla, CA	Plenary	Hyatt Regency	
14-18	Sept	1998	Waltham, MA, tent	Interim WG		Rhaytheon
8-13	Nov	1998	Albuquerque, NM	Plenary	Hyatt Regency	
7-12	March	199	Austin, TX	Plenary	Hyatt Regency, Town Lake	
4-9	July	1999	Montreal, PQ	Plenary	Queen Elisabeth Hotel	
7-12	Nov	1999	Koloa, HI	Plenary	Hyatt Regency Kauai	

## Attendance list

Full name	att. %	memstatus	company	phone	e_mail
Mr. Jeff Abramowitz	95	voter	3Com Corporation	+1 408 764 5974	jeff_abramowitz@3com.com
Mr. Matthew Alspauch	54	nonvoter	Spectralink	+1 303 440 5330	matta@spectralink.com
Mr. Keith B. Amundsen	100	voter	Raytheon Company	+1 508 490 1759	keith_b_amundsen@raytheon.com
Mr. Carl F. Andren	100	voter	HARRIS Corporation	+1 407 724 7535	candren@harris.com
Mr. Kazuhiro Aoyagi	82	voter	Showa Electric Wire & Cable Co. Ltd.	+81 427 73 7211	k860822@snt1.swcc.co.jp
Mr. David Bagby	85	voter	Advanced Micro Devices	+1 408 749 5425	david.bagby@amd.com
Mr. James R. Baker	100	aspirant	Netwave Technologies Inc.	+1 510 737 1646	jbaker@netwave-wireless.com
Mr. Phil Belanger	95	voter	Aironet Wireless Communications Inc.	+1 330 664 7953	pbela@aironet.com
Mr. John Biddick	100	voter	Intermec Corporation	+1 206 348 2600 X6647	jbiddick@intermec.com
Mr. Simon Black	90	voter	Intalk Ltd.	+44 1223 847400	simonblack@intalk.com
Mr. Jan Boer	100	voter	Lucent Technologies Nederland	+31 30 609 7483	janboer@lucent.com
Dr. Ron Borgstahl	30	nonvoter	Motorola	+1 602 441 0825	p26836@email.mot.com
Mr. Richard C. Braley	30	nonvoter	Federal Express Corporation	+1 901 375 6535	rcbraley@fedex.com
Mr. Wesley Brodsky	100	voter	Raytheon Company	+1 508 490 1616	wesley_g_brodsky@res.raytheon.com
Mr. Duane Buddrius	30	nonvoter	Solectek Corporation	+1 619 450 1220 X3011	dbuddriu@solectek.com
Dr. John H. Cafarella	100	voter	Micrilor Inc.	+1 781 246 0103	johncafarella@worldnet.att.net
Mr. Dave Carlson	15	nonvoter		+1 908 264 2581	dcarlson@netlabs.net
Mr. Naftali Chayat	100	voter	BreezeCom	+972 3 645 6262	naftalic@breezecom.co.il
Mr. Wen-Chiang Chen	100	nonvoter	Industrial Technology Research institute	+886 3 5917157	810739@cclol.ccl.itri.org.tw
Mr. Greg Copeland	15	nonvoter	Integrated Device Technologies Inc	+1 408 654 6745	copeland@idt.com
Mr. Randy Dence	30	nonvoter	Clarion Corporation of America	+1 310 965 1718	rdence@xmission.com
Mr. Wim Diepstraten	97	voter	Lucent Technologies Nederland	+31 30 609 7482	wdiepstraten@lucent.com
Mr. Richard Ditch	30	nonvoter	Motorola		
Mr. Darrol Draper	100	voter	Golden Bridge Technology	+1 303 452 2185	dfdraper@ix.netcom.com
Dr. Joseph L. Dvorak	30	nonvoter	Motorola	+1 305 72 4818	ejd023@email.mot.com
Mr. Peter Ecclesine	100	voter	Cisco Systems Inc.	+1 408 527 0815	petere@aimnet.com
Mr. Richard Eckard	100	nonvoter	GTE Laboratories Inc.	+1 781 466 2780	reckard@gte.com
Mr. Gabriel A. Edde	30	nonvoter	Thomson Consumer Electronics	+1 317 587 3668	eddeg@indy.tce.com
Mr. Darwin Engwer	100	voter	Netwave Technologies Inc.	+1 510 737 1600	dengwer@netwave-wireless.com

Full name	att. %	memstatus	company	phone	e_mail
Mr. Greg Ennis	90	nonvoter		+1 408 358 5544	gennis@mindspring.com
Mr. John Fakatselis	100	voter	HARRIS Corporation	+1 407 729 4733	jfakat01@harris.com
Mr. Jeff Fischer	100	voter	Micrilor Inc.	+1 781 246 0130	jefffisch@aol.com
Mr. John Fisher	97	voter	Proxim Inc.	+1 650 526 3703	johnf@proxim.com
Mr. Ian Gifford	94	nonvoter	M/A-COM Inc.	+1 978 442 4650	marketing@macom.com
Mr. Motohiro Gochi	100	voter	Clarion Corporation of America	+781 245 7001	mgochi@msn.com
Mr. Tim Godfrey	100	voter	Choice Microsystems	+1 913 897 0908	tgodfrey@choicemicro.com
Dr. Ken C. Greenwood	25	nonvoter	Sanders Lockheed Martin Telecomms	+1 603 645 5439	ken.c.greenwood@lmco.com
Mr. Peter van Grinsven	15	nonvoter	Philips Research		
Mr. Jan Haagh	100	voter	Lucent Technologies Nederland	+31 3060 97464	haagh@lucent.com
Mr. Karl Hannestad	100	voter	Netwave Technologies Inc.	+1 510 737 1600	khannest@netwave-wireless.com
Mr. Kei Hara	97	nonvoter	Silicon Dynamics	+1 408 245 6600	hara@sidynamics.com
Mr. Mohammed Hasan	100	nonvoter	Nortel	+1 972 689 1732	hasanm@nortel.com
Mr. Victor Hayes	100	voter	Lucent Technologies Nederland	+31 30 609 7528	vichayes@lucent.com
Dr. Chris Heegard	100	aspirant	Alantro Communications	+1 707 521 3062	heegard@ee.cornell.edu
Mr. Robert Heile	75	voter	BBN GTE Interworking Technologies	+1 617 873 4835	bheile@bbn.com
Mr. Maarten Hoeben	93	voter	No Wires Needed B.V.	+31 30 228 0910	maarten.hoeben@nwn.nl
Dipl.-Ing Mario Huemer	100	nonvoter	Johannes Kepler Universitaet Linz	+43 732 2468 9714	huemer@mechatronik.uni-linz.ac.at
Mr. Duane Hurne	100	voter	Golden Bridge Technology	+1 972 517 2115	dhurne@stargate-com.com
Mr. Thomas J. Hutton	45	nonvoter	Symbol Technologies Inc.	+1 408 369 2627	tomh@psd.symbol.com
Mr. Masayuki Ikeda	100	voter	Seiko Epson Corp.	+81 266 52 3131	ikeda.masayuki@exc.epson.co.jp
Mr. Hiroyasu Ishikawa	100	aspirant	Kokusai Denshin Denwa Co. Ltd (KDD)	+81 492 78 7856	ishikawa@lab.kdd.co.jp
Mr. Yoshiki Iwasaki	40	nonvoter	JVC	+81 468 36 3136	iwasaki@krhm.jvc-victor.co.jp
Mr. Richard Jai	100	voter	Symbol Technologies Inc.	+1 408 558 2861	rjai@psd.symbol.com
Mr. Donald C. Johnson	100	voter	NCR	+1 937 445 1452	donald.c.johnson@daytonoh.ncr.com
Mr. Ad Kamerman	100	aspirant	Lucent Technologies Nederland	+31 30 609 7479	kamerman@lucent.com
Mr. Nobuo Karaki	100	voter	Epson R&D, Inc.	+1 408 952 6102	nkaraki@erd.epson.com
Mr. Dean M. Kawaguchi	100	voter	Symbol Technologies Inc.	+1 408 369 2629	deank@psd.symbol.com
Mr. Stuart J. Kerry	100	voter	Butterfly Communications Inc.	+1 408 496 6868	stuartk@butterfly.com
Mr. Rex L. Kesser	63	aspirant	AMP Inc.	+1 717 986 3790	rlkesser@amp.com
Mr. Patrick Kinney	90	nonvoter	Intermec Technologies Corp. (Norand)	+1 319 369 3593	kinneypw@norand.com
Mr. Mikio Kiyono	48	nonvoter	EXD Technologies Inc.	+1 408 970 1480	mikio@exdt.com

Full name	att. %	memstatus	company	phone	e_mail
Ms. Hikaru Kudoh	89	nonvoter	NEC Corporation	+81 44 856 2255	hikaru@ccm.cl.nec.co.jp
Mr. Brian Langlais	4	nonvoter	West End Systems	+1 613 623 9600	brian-langlais@qmail.newbridge.com
Dr. Richard P. LaRowe Jr.	45	nonvoter	BBN GTE Interworking Technologies	+1 617 873 2193	rlarowe@bbn.com
Mr. Mike Lemieux	100	nonvoter	DNPG Cabletron Systems Inc.	+1 978 506 5497	mike.lemieux@digital.com
Mr. James S. Li	100	aspirant	Institute for Information Industry	+886 2 564 3588 X147	jamesli@iii.org.tw
Dr. Reza Majidi-Ahy	94	aspirant	RadioLAN	+1 408 524 2600	rahy@radiolan.com
Mr. Isao Masaki	100	voter	Clarion Corporation of America	+1 310 965 1718 X4718	isaomasaki@msn.com
Mr. Jim McDonald	94	voter	Motorola Inc.	+1 847 576 3169	cjm015@email.mot.com
Mr. Michael D. McInnis	100	nonvoter	The Boeing Company	+1 425 865 2840	michael.d.mcinnis@boeing.com
Mr. Gene Miller	60	voter	Raytheon Company	+1 508 490 1838	gene_d_miller@res.raytheon.com
Dr. Akira Miura	100	voter	AJM Consulting	+1 408 371 4234	Miura_Akira@email.msn.com
Mr. Henri Moelard	100	aspirant	Lucent Technologies Nederland	+31 30 609 7551	moelard@lucent.com
Mr. Masaharu Mori	89	voter	Clarion Co. Ltd.	+81 48 443 1111	masmori@msn.com
Dr. Masahiro Morikura	100	voter	NTT Wireless Systems Labs.	+81 468 59 3132	morikura@mhosun.wslab.ntt.co.jp
Mr. Wayne D. Moyers	100	aspirant		+1 408 338 7562	wdm119@concentric.net
Mr. Ken Naganuma	100	aspirant	Toko America Inc.	+1 847 635 3246	knaganuma@tokoam.com
Mr. Ravi P. Nalamati	100	voter	DNPG Cabletron Systems Inc.	+1 978 506 5189	nalamati@mail.dec.com
Mr. Peter D. Narvaez	14	nonvoter	Philips Semiconductors	+1 408 991 3688	peter.narvaez@svsc.philips.com
Dr. Richard van Nee	93	voter	Lucent Technologies Nederland	+31 30 609 7412	vannee@lucent.com
Mr. Bob O'Hara	100	voter	Informed Technology Inc.	+1 212 463 7937	bob@informed-technology.com
Mr. Larry P. Ochs	15	nonvoter	XETRON Corporation	+1 513 881 3266	larryo@xetron.com
Dr. Tomoki Ohsawa	100	voter	NEC Corporation	+81 44 856 2242	ohsawa@nwk.cl.nec.co.jp
Mr. Kazuhiro Okanoue	100	voter	NEC Corporation	+81 44 856 2255	okanoue@ccm.cl.nec.co.jp
Mr. Roger Pandanda	45	aspirant	MCS Corporaton	+1 619 558 9300	pandanda@mcsc.com
Mr. Al Petrick	100	voter	HARRIS Corporation	+1 407 729 4944	apetrick@harris.com
Ms. Victoria M. Poncini	33	voter	The Boeing Company	+1 425 865 5342	victoria.m.poncini@boeing.com
Mr. Jon Rasmussen	30	nonvoter	Intermec Technologies Corp. (Norand)	+1 319 369 3508	rasmussj@norand.com
Mr. Gregory S. Rawlins	100	aspirant	Signal Technologies Inc.	+1 407 260 0175	grawlins@quik.com
Dr. Stanley A. Reible	98	voter	Micrilor Inc.	+1 617 246 0103 X105	reible@compuserve.com
Mr. Frits Riep	100	nonvoter	DNPG Cabletron Systems Inc.	+1 978 506 6962	frits.riep@digital.com
Mr. William Roberts	100	voter	American Microsystems Inc.	+1 208 233 4690 x6514	wroberts@poci.amis.com
Mr. Kent G. Rollins	100	voter	HARRIS Corporation	+1 407 729 5133	krollins@harris.com

Full name	att. %	memstatus	company	phone	e_mail
Mr. Philippe Rouzet	74	nonvoter	Dassault Electronique	+33 01 34 81 45 77	philippe.rouzet@dassault-elec.fr
Dr. Clemens C.W. Ruppel	100	voter	Siemens AG	+49 89 636 5 33 25	c.c.ruppel@ieee.org
Mr. Chandos Rypinski	94	voter	Ubiquity Communications	+1 707 792 5392	rypinski@microweb.com
Mr. Roy Sebring	100	voter	Intermec Corporation	+1 425 356 1740	rsebring@intermec.com
Dr. Tie-Jun Shan	83	nonvoter	Lucent Technologies	+1 732 949 1721	tjs@lucent.com
Mr. Mike Shiba	85	voter	Symbol Technologies Inc.	+1 408 369 2695	mikes@psd.symbol.com
Dr. Hideyuki Shinonaga	100	aspirant	Kokusai Denshin Denwa Co. Ltd (KDD)	+81 492 78 7850	shinonaga@lab.kdd.co.jp
Mr. Matthew B. Shoemake	100	nonvoter	Alantro Communications	+1 707 521 3060	shoemake@alantro.com
Mr. Jim Slater	30	nonvoter	Nomadic Technologies	+1 650 988 7200	jcslater@robots.com
Mr. Gary Spiess	100	aspirant	Intermec Technologies Corp. (Norand)	+1 319 369 3580	spiess@norand.com
Mr. Larry Strelow	100	nonvoter	The Boeing Company, ISS	+1 316 526 9387	
Mr. Hitoshi Takanashi	100	voter	NTT Wireless Systems Labs.	+81 468 59 3471	takanasi@pcs.wslab.ntt.co.jp
Mr. Satoru Toguchi	100	voter	JVC	+81 462 78 1871	toguchi@krhm.jvc-victor.co.jp
Ms. Cherry Tom	100	voter	AT&T Laboratories	+1 973 386 4192	ctom@att.com
Mr. Mike Trompower	100	voter	Aironet Wireless Communications Inc.	+1 330 664 7920	mtrom@aironet.com
Mr. Kiyoshi Tsujimura	82	nonvoter	Kaytec	+81 3 5982 4671	kiyoshi@kaytec.co.jp
Mr. Bruce Tuch	94	aspirant	Lucent Technologies Nederland	+31 3060 97527	btuch@lucent.com
Mr. Eric Vallet	34	nonvoter	Dassault Electronique	+33 1 49 11 80 08	eric.vallet@dassault-elec.fr
Mr. Sarosh Vesuna	60	voter	Symbol Technologies Inc.	+1 408 369 2657	saroshv@psd.symbol.com
Mr. Ikuo Wakayama	100	nonvoter	NEC Corporation	+88 3 3798 9616	wakayama@wsd.ho.nec.co.jp
Mr. Mark Webster	45	aspirant	Harris	+1 407 724 7537	mwebster@harris.com
Dr. Nien C. Wei	97	voter	AT&T Laboratories	+1 973 386 2053	ncw@mailnet.ho.att.com
Mr. Jim Wong	15	nonvoter	Hewlett-Packard Company	+1 408 746 5494	james_wong@hp.com
Mr. Harry Worstell	100	voter	AT&T Laboratories	+1 973 386 7856	hrw3@mailnet.ho.att.com
Mr. Lawrence W. Yonge III	100	nonvoter	Intellon Corporation	+1 352 237 7416 X358	larry.yonge@intellon.com
Mr. Chris Zegelin	100	aspirant	Symbol Technologies Inc.	+1 408 369 2667	chrisz@psd.symbol.com
Mr. Steven A. Zelubowski	78	aspirant	M/A-COM Inc.	+1 978 442 4621	zelubows@macom.com

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**IEEE P802.11**  
**Wireless LANs**

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**802.11 Task Group A (5 GHz Study Group)**  
**Tentative Minutes of the March 1998 meeting**

Chair: Naftali Chayat

Secretary/Editor: Mike Trompower

Monday, 9 March 1998

meeting called to order at 8:30 by Naftali

Naftali provides short overview of 802.11 5GHz

Set Agenda:

- approval of Minutes from November Meeting
- create list of current submissions
- selection procedure
- data relevant to the judging of proposals
- discussions concerning data submissions
- perform the selection
- set agenda for May Meeting

**Motion 1**(approved by 17,0,1): (Al Petrick/Carl Andren)  
motion to approve agenda as established above

**Motion 2**(approved by unanimous consent):  
motion to approve minutes of January meeting task group A

Submissions

New Document list is the following:

General information:

- Bob Ohara (98/104) General considerations for choosing a PHY
- Don Johnson (98/86) Out of band emission requirements
- Steven Zelubowski. (98/105) Spectral regrowth in OFDM
- Naftali (98/106) Power Amplifier Modeling
- Chandros Rypinski (98/110) Selection basis for 5GHz

Modulation evaluation:

- Naftali (98/107) joint NEC-Breezecom proposal
- Naftali (98/108) Tga performance summary
- (98/111) General Partial Response Pulse Shape recommendation
- (98/72) combined Lucent/NTT OFDM proposal
- Kazuhiro O. (98/78r1) Comparison data for QPSK Phy
- Masahiro M. (98/71a) Evaluation results for OFDM
- Naftali (98/76) BreezeCom OQM performance

reserved time for the following

- Reza Ahi (98/134) L-PPM criteria evaluation

Micrilor withdraws its proposal in the 5GHz band because of the 20Mbps data rate requirements puts sufficient restrictions on the modulation that it is deemed not robust enough for this band. Micrilor remains committed to the 2.4GHz band where their proposed modulation has sufficient merit.

Presentation of document 98/104 by Bob Ohara , Informed Technologies

“Further considerations when choosing a PHY”

- MAC management must be considered in addition to the PHY
- Lack of physical layer channelization impacts cell plan leading to:
  - reduced throughput in all cells
  - loss of PCF functionality
  - scanning algorithms are complicated
  - perceived system delays to users

Presentation of document 98/86 by Don Johnson , NCR Corporation

“U-NII out of band emission requirements”

- power spectral density rules as described in 15.403
- out of band requirements are described in terms of power spectral density
- restricted band rules are defined in 15.35, 15.205, 15.209 using EIRP definitions
- conducted limits are specified in 15.207
- due to WinForum recommendations it is expected that there will be several FCC rule changes
- by factoring in the packet nature of the protocol, the lower duty cycle operation yields about 12 dB margin improvement at the band edge restriction requirements
- intermodulation and sideband regrowth should be considered for each modulation (ref doc:97/80)

Presentation of document 98/105 by Steven Zelubowski, M/A-Com

“Spectral regrowth in OFDM”

- output power backoff has been talked about, but no data has been given to date
- issues are channelization and power efficiency

Presentation of document 98/106 by Naftali Chayat, BreezeCom

“Power Amplifier Modeling”

- additional backoff will be required to pass the current FCC band edge requirements
- Naftali expresses opinion that OBO will be required for the OFDM proposals
- Naftali suggests that the issue is readdressed and the comparison be made using Rapp’s Power amplifier model and will be revisited during the selection criteria session

The current list of proposals are the following:

- 1) OFDM by Lucent and NTT (replaces the individual proposals)
- 2) OQM proposal by BreezeCom and NEC (additional to the individual proposals)
- 3) OQM BreezeCom
- 4) OQM NEC
- 5) RadioLAN

Naftali: Is there objection to the presentation of the ‘combined’ BreezeCom/NEC proposal as it has not been previously presented?

The proposal highlights the element taken from the individual proposals and stresses a new pulse shape. Simulations are not extensive.

**Motion 3**(tabled until 7PM): (Carl Andren/ Wesley Brodsky)

move to allow the joint BreezeCom/NEC OQM proposal be accepted as a valid Tga proposal.

Discussion

Carl: This proposal is “in the spirit” of the task group agenda.

Jan Boer: Does the approval of this motion disallow the individual proposals? The fact that BreezeCom and NEC cannot decide, how can the rest of the committee decide between the three proposals.

John Cafarella: echoes that the apparent indecision is not a good one.



Naftali: agrees that the points are valid and that NEC and Breezecom will consult and suggests that this motion be tabled until the beginning of the next TGA session (7PM tonight)

**motion tabled until 7PM by consensus**

Presentation of document 98/107 by Naftali Chayat

“Joint NEC/Breezecom OQM proposal”

- common items between proposals were listed
- different items between proposals were highlighted
- the unified proposal will use the following parameters:
  - use smaller amplitude variation in order to improve spectral shape
  - use the SRRC pulse with 50% rolloff
  - retains the multilevel mode
  - the preamble to be used will be 320 usec long
  - interleaving will be used
  - new frequency plan using 20MHz band edge distance obtaining 9 and 4 channels
  - waveform accuracy specification as defined in the NEC proposal with adaptation from QPSK to OQM
  - there will be a 3 tap equalizer to suppress ISI
  - center frequency accuracy will be 10ppm

Meeting adjourned for lunch at 11:55

Meeting reconvened at 7:20 by Naftali

**Motion 3** from the table

Naftali announces that both BreezeCom and NEC agree to abandon their separate proposals in favor of a single joint submission.

**motion 3 passes (20-0-6)**

There are now three remaining proposals to consider: joint Lucent/NTT, joint Breeze/NEC, RadioLAN

Naftali reviews the status of the currently submitted data and items what is still required by each presenter.

Meeting adjourned 8:00

Tuesday, 10 March 1998

meeting called to order at 08:30 by Naftali

begin with review and agenda of submissions today

ask for opinions on whether to extend to the modulation choice deadline until May in order to allow the presenters to bring additional data pertaining to the 'new' power amp modeling criteria and out of band emission criteria.

Presentation of document 98/107 by Naftali

“Joint NEC-BreezeCom Tga Proposal”

basis is OQM proposal with SRRC pulse shape as presented by BreezeCom

data rates are 21Mbps to 100Mbps with expected maximum useable rate of 50Mbps

differential decoding is applied

shortened Hamming code combined with various interleaving levels is defined

320 bit (13usec) preamble defined to allow for better detection and diversity determination

channel spacing of 5MHz is defined giving 9 channels in lower band, 4 channels in upper band

hopping is not specified, however, a 224usec channel switch time is defined

Questions:

Carrier frequency accuracy is defined at 60ppm instead of 120ppm as currently defined

there are two output power back off levels defined in order to meet band edge requirements

Naftali presents the performance data on the joint proposal

questions

meeting adjourned at noon

Meeting reconvened at 7:45PM

presentation of document #74r1 by NEC and accompanied by BreezeCom

supporting material for joint NEC-BreezeCom proposal

presentation of document #111 by Chandos Rypinski

“General Partial Response Pulse Shape Recommendation”

description of the purpose of shaping

used NEC proposal as example of “good” shaping as it requires no guard band

presentation of document # by Chandos

“selection criteria for 5 GHz”

Chan wants to highlight the merits of the remaining proposals with the following criteria:

-out of bound emissions

-frequency reuse

-coding and aggregate system capacity

-acquisition time

meeting adjourned at 9:00

Wednesday, 11 March 1998  
meeting called to order at 08:30 by Naftali

presentation of document #71a by NTT and Lucent  
“Joint NTT Lucent OFDM proposal”  
consult the document for technical details  
20 and 30 Mbps modes are shown to withstand over 200ns delay spread  
large SNR needed for long packets when in presence of large delay spread

information was presented pertaining to solutions to the additional criteria requirements put forth on Monday  
regarding out of band emissions and power amplifier modeling

question regarding mandatory rates, leads to response that 20Mbps is required which forces coherent detection into  
the implementation which uses 3 sub carriers using pilot tones instead of data.

presentation of document #134 by Reza Ahi, RadioLAN  
“5GHz UNII band - L-PPM proposal”  
system is a pulsed RF based modulation  
RadioLAN current product now operates under FCC15.249 low power rules (as opposed to .247 rules)  
states that a rule change is under consideration to allow higher power under these rules  
CCI analysis is under study and will be provided tomorrow – suggests that all modulation use a common channel  
model for the comparison  
A data scrambler method is under investigation

questions:

it was mentioned that operation would be with a 0 or 1dB backoff , the emissions were measured in the lab to be  
compliant

RadioLAN will be submitting additional information explaining how the analysis was performed

meeting adjourn at 12:00

Thursday, 12 March 1998

meeting called to order at 1:15PM by Naftali

presentation by Hitoshi (NTT) outlining additional information added to DOC#71ar1

presentation by Hitoshi (NTT) of DOC#143

“Throughput and Cell Radius comparison of Tga PHY submissions”

comments from Naftali and Reza make points that the data used in the paper do not reflect consistence use of data across all proposals

Naftali provides verbal update of the Joint BreezeCom-NEC proposal (DOC#144)

Breezecom estimates using .3 micron process

300mW with equalizer running in adaptive mode

200mW with equalizer trained only at beginning of frame

chair passed to John Fakatselis

Naftali presents DOC#145

“L-PPM proposal is broken”

The submission is Naftali’s opinion backed by technical information

argument 1- transmitter does not conserve power

argument 2- L-PPM is susceptible to multipath

argument 3- differential encoding loses 3dB sensitivity and is prone to pulse insertion

argument 4- packet length is data dependent

Naftali recommends that this proposal should not be considered further and should be eliminated at this meeting.  
discussion-

Chan claims that Naftali simplified the modulation and the conclusions are not necessarily valid.

Reza shows that the transmitter must be off between pulses, therefore there is a power savings

much back and forth bantering

opinion of group is that RadioLAN MUST provide information regarding the modulation

chair returned to Naftali

Naftali discusses the “down selection” process which will be used to eliminate proposals at the May meeting since the group failed to select a modulation at this meeting. “We are already in violation as No vote was taken and the justification is the additional requirements which were levied on Monday.”

**Motion 4(defeated by 6,15,16):** (Jim McDonald/Chandos Rypinski)

motion not to perform downsizing at May 98 meeting.

required by each proposal are: implementation details for a reference design, DC consumption, transmitter chain,

**Motion 5 (passes by 8,1,15):** (Carl Andren /Wes Brodsky)

move to adjourn

meeting closed 3:00

## Task Group B meeting minutes

**March, 9, 1998 1:00 PM**

Chair: John Fakatselis  
Secretary: Carl Andren

### **Approval of agenda**

Motion to approve minutes Jan/Kent 30-0-4

### **Background of task group B**

### **Discussion of selection process**

Formation of the selection task group: William Roberts and Carl Hofstead of Netwave will form the committee to review the Proposals

### **General Papers:**

114, Symbol FH interoperability addendum to Harris prop  
118 Clarion  
104 Informed Technology, cell Planning  
115, Harris, Equalizer techniques

### **Proposals to be considered:**

116, Harris, Proposal  
79, KDD  
80, KDD  
81, KDD,  
99, Lucent  
10B, Lucent ,draft text  
100, Lucent  
117, Microlor, update of prop  
101,102, Golden Bridge Technology  
82, 83, 84, 85 Alantro

### **General Papers:**

#### **Paper 104 Further Considerations When Choosing A PHY, Bob O'Hara**

Two channels are not sufficient to make a cell planning scheme work. MAC management functions are not workable with just two channels. A mobile station is unable to scan until it is in undesirable conditions where it has least time to do so.

#### **Paper 115 Sliding DFE equalizer for improved low cost equalization, Carl Andren, Harris**

(Ad Kamerman) How do you do the timing for the sliding mechanism? Try at various times, find the peak. How fast can it make a decision is a factor.

(Chris Hegard) Diversity switching before equalization? Take the channel impulse response on both antennas. Change in the training time (preamble length)? Propose existing preamble. FH preamble then short DS training preamble. Not determined the shortest possible.  
Combine two antennas? Cost problem.  
(Naftali Chayat) DFE on QPSK symbol? No the BPSK preamble. Looking into the accuracy of the BPSK training. Hard decision process losses 2 dB plus error propagation. May turn off the equalizer when the SNR is low. How will we do the carrier tracking in multipath. Same methods. Carrier and chip timing in the bandwidth.  
(John Cafarella) No short preamble for equalization? Can't be as short as desired due to AGC and equalization. 50 microsec is the target now.  
(Ad Kamerman) Over sampling in the model? Four times the chip rate.  
(Harry Worstell) Equalizer size and power for PCMCIA? Maybe 2x gate count of the current BBP that is 10% of radio power consumption.

**Tuesday, 1PM**

Review of agenda and the problems of not enough time. Will have 45 minutes for each presenter.  
Discussion of secret balloting process and presentation of the sample ballot.

**Paper 114 FH Interoperability addition to Harris prop, Dean Kawaguchi, Symbol**

Need more interference immunity due to fixed frequency, non 802.11 systems.  
Jon Boer, What is the intent of this amendment? It will be included as part of the Harris proposal as an option. Is it true that this option can be applied to the other proposals? Yes, but we having discussions right now only with Harris.  
Ad Kamerman, Will it work well in different environments Vs frequency planning? Yes, if you have complete control of the band, you can get better efficiency. But once you have large interference, this will work better. This allows the system to be installed without much planning. If the station can scan different frequencies, the AP can do a better job. We tried that at 900 MHz, it didn't work as well.  
Kip, Is this a different proposal? No, it will be part of the Harris proposal.  
John Cafarella, Why does the high speed PHY have to address this? Any company can implement their own interoperability modes.. This tries to reduce the amount of collisions, and needs to be addressed in the standard.  
Wayne, a fallback rate is good, and it has lower spectral occupancy. What is the impact on the effect of power spectral density? There is no impact on the  
Daryl, What is the benefits of this?  
Bruce, from a Lucent perspective, this is not necessary to decide on now. If you look at who is doing the voting, the FH group needs to know that this is a viable option.  
Ahi, where is the file? The file was misnamed on the disk and will be redistributed.

**Paper 118, Advantages Of Code Channelization, Mas Mori, Clarion**

Based on Micrilor's prop on code channelization. An introduction to overcome conventional ideas on code channelization.  
Mark, Have multipath components been included? No  
Greg, what Floor attenuations were used? 10 dB  
Dean, Do you assume that the coeds are not synchronized? Yes. It is not the cross correlation of the codes. The codes were picked for best performance.  
Naftali, do you think that using different codes for different stations produces less interference? Yes.

**Paper 100, The Standard To Rely On, Bruch Tuch, Lucent**

What is the real difference? 10% FER will cause many support calls. What you get over the cable does not translate into indoor coverage. Wavelan 1 had a 90 ns delay spread. Retail customers bitched that it did not work well. Experience says 150 ns is needed. Simple, but effective. 60K gates for the Lucent equalizer. Clear IP coverage is a safety net.  
Naftali, after this neutral propaganda, why did you wait for years to suggest it? The company needed to make many decisions before supporting it. Can you give your own requirements on delay spread. You must have 100 ns minimum and then be able to get easily to 150 and more.  
John, You went from quoting a requirement to quoting a solution... We believe that a product should be better than 10 % PER. You need a graceful way to get there.

General papers done.

## PROPOSALS

### Paper 92, Advanced Barker DS , Golden Bridge Technologies, Darrol Draper

Has many rates depending on how many codes are used. All of the rates shown cross over at 45 ns. FEC can make the performance to large delay spreads. They use a Rake receiver. The Rake does not have an equalizer and no need to train one. When you get to 1 code, the delay spread goes to 4000 ns. You do not have to transmit all of the levels, so the transmitter backoff is less. You delete the extra levels in the digital, so the transmitter backoff does not have to handle it. Optional short preamble. Save 80 us off preamble. 48 us preamble will cause some interference with low speed systems. 6 way antenna diversity.

John, Some items on the comparison matrix were not presented. It is in the electronic copy and 98/26,27,28 this year and 97/27 last year.

Ad, Your preamble was 48 us but do you need more time for frequency offset. No, by the time it gets to the MPDU the carrier loop is locked up. Draft text is 98/91.

Dean, The antenna diversity time is two dwells, but if the signal is not synchronous, you need to allow more time for skew. The receiver is triggered by signal energy. You are talking of not being synchronized to slot time? Yes, how many us do you need to add. See 94/70 for an analysis.

Dean, how do you get better performance with FH? If the channel occupancy time goes down, there is less time for interference.

Greg, Can you explain the 6 fold antenna diversity concept? You need long header for that. With 128 us preamble, you have enough time for 6 antennas. The sector antennas are not necessarily overlapped.

Naftali, With one or two codes, you show up to 4 ms RMS delay spread, how do you get that performance? With the FEC and Rake receiver, you need to go out that far to make the PER go to 10%.

Naftali, Rake is not used in conjunction with coherent detection... Rake is like an equalizer and has a tapped line. We use a maximal likelihood combiner.

Naftali, How many taps did you use? The simulations used a large number of fingers.

Keith, What codes are suggested. We use BCH Block codes for lower gate counts.

John C., could you clarify the primary rates? All of them.

### Paper 114, Harris 11Mbps MBOK proposal, Carl Andren and Mark Webster.

Questions:

AD Kameron: The impact of antenna diversity is less than expected.

Jan Boer: PER Vs thermal noise graph, what is the RMS delay spread, it wasn't given on slide 13 of the presentation.

Answer: Mark Webster; The intent was to assume 10 PER. Slide 12 is uses multipath with no noise. The eye is closed for both 64 and 1000 byte packets. The intent was to show a few taps and a low cost implementation.

Jan Boer: At what point does the curve come back to 10-1 PER? Answer: Mark W. Not shown on the slides.

Jan Boer: Does the short preamble include the header? Yes

Keith Admunsen: Why the gap between the DS and FH preamble: Answer: This was added to satisfy the FCC that this is not a hybrid waveform.

### Paper 79, CFO-SS compliance document, H. Isikawa, KDD Labs

Carrier Frequency Spread Spectrum. 10 MBps receiver uses 5 channels of their current low rate PHY. Needs a power splitter/combiner for the 5 channels. Takes 20-30K gates plus 5 SAWs. Will need a Rake receiver to meet the longer delay spreads. The high rate PHY will achieve almost the same delay spread as the low rate PHY. They used an 11 wave exponentially decaying, Rayleigh fading model. Power consumption is less than 5 x low rate PHY.

Ad, What are the assumptions for the power amplifiers? With PAs in each transceivers, the backoff is 5dB. With one PA, there is a need for 10 dB backoff.

Wayne, Would explain the 6 PAs? 5 predrivers and one final PA after the combiner.

John C., If you amplify after the combiner, you have to handle 5 dB more peak to average ratio.

**Wednesday 1 PM**

Review of secret balloting procedures.

**Motion** for each of the proposals to comply with the Japanese regulatory rules and show how they conform to these rules.

Jan/JanB

Ruled out of order.

Appealed Jan/JanB

Question called Keith/Wes (32-6-6)

**Paper 80997, Barker Code Position Modulation, Jan Boer, Lucent Technologies**

BCPM has 5, 8 and 10 MBps and complies with FCC, ETSI, and MTT. 10 MBps is an optional rate. They suggest that 10 % FER is too high and means that 10 % of locations are not able to communicate. Equalizer implementations have problems. Complexity, training, tracking, timing, and stability. MLSE receivers can be complex and BCPM makes it simple. Their simulation is in C code. Then they simulated in SPW and then to VHDL with gate synthesis. Channel matched filter gains a lot of performance. Tentative symbol estimator removes cross rail interference. Mode sifter calculates trellis and determines ISI. Same size BBP, pad limited before. RX current about the same as before. Diversity the same as low rate. Optional short preamble is 77 us. Mode sifter added 4 symbols, but SIFS has enough time. System throughput more important than ACI. CCI is 6 dB. Needs 4 dB backoff to 2 MBps, 3 dB more for higher speeds. With 20 us slot time, you can also be interoperable with short preamble. The short preamble has 54 bit preamble and an SFD. Then it goes to 5 MBps for the high rate header. Receiver can be set to receive either short or long preamble. If preamble goes on too long, it switches to the long mode. Therefore interoperable with both long and short preambles. Will go with Symbol's FH interoperability.

Dean, Do you think it is misleading to say that 10 % PER means that 10 % of stations can't communicate? In general, a stochastic channel is time varying. You said that 1 % PER is necessary, but your curves flare out at 10%, is that a problem? .. No, we showed the 10% since that is what was asked for.

Chris, Do you consider your system a DSSS system? Yes

Chris, You introduce memory into the channel, what is the coding and memory requirements? The trellis is very short. The overlapping of the sidelobes is taken out before the trellis. Then you only need to handle 4 symbols in the trellis.

Chris, Are there economic receiver structures? You can't specify the receiver structure in the standard. Coding gain is 5 dB for the 8 MBps mode. We feel that the spreading is true and the FCC agreed.

Chris, how many levels are there? 5

Chris, Isn't the CMF an equalizer? No, it is different.

John C. The channel matched filter is an inner product

, On page 7 there is a statement that the 10 MBps multipath is inherent to bpcm. Multipath reduces your fading margin.

Carl, Does your diversity algorithm use the same technique as the low rate? It should not be specified in the standard.

Greg, What bit rate is your -89 dBm sensitivity measured at? 8 MBps,

Greg, What is average transmit power that the FCC would allow you to transmit. We back off 7 dB.

Greg, What range would estimate in the indoor environment? Take the -89 dBm and fill in your path loss. We would get about 160meters in an unobstructed office.

Greg, For a system with a similar sensitivity a system that can transmit at a higher power you would get more range. If you want range, you need protection against delay spread. If the multipath means that the receive sensitivity, then the more power you get out of the PA is not important. It is 3 dB less path loss in any case.

John C., How does the 10 MBps get the same sensitivity? You are shifting very little. It is less than 0.5 dB. But in the presence of delay spread, it is much more.

Ahi, You need 3 dB more backoff, how do you get the same power consumption? It operates at a lower power level on the average. How about the MLSE? The DSP is consuming a little more.

??, You are going from 8 to 10 MBps and get the same PG? You just shift the sequences over each other. If you didn't use PPM, can you overlap the symbols? Yes, there is still the overlap of two Barker codes.

Dean, Part of the decision process is showing how the proposals are implementable. More comments on diversity would help me decide if there is enough time to do all that is necessary. For the long preamble, it is clear that there is enough time.

Diversity can be done in the 20 us slot time. More information helps the decision process.



**Paper 81177, Proposal for 2.4 GHz PAR, John Caferella, Micrilor**

We support two frequency channels for a variety of reasons. Wideband is better at resolving the multipath. In multipath you need good cross correlation performance. New algorithm uses an 8 tap CMF. It does not need large tap accuracy or training. We get 200 ns at 1% PER with the new scheme. The FEC gains you about 2 dB and the diversity 1 dB. CMF costs 2 K gates and FEC about 1 K gates. The extra 3 dB of PG doubles your coverage area. Can also get 18 MBps with combination of OCDM. They have a 24 us preamble and header. 9.5 MBps at 1500 byte packets. MSK uses full PA power. About 35 K gates without interoperability. Use best 8 of 2048 code cosets for demodulation and for search. Code channelization is better than having 3 channels.

Wes, How do CDMA codes combine with MOK? Do you get the full factor of 4 rejection? We get more. That is why you need the best cosets. The leakage problem is more important. This means that the other BSA will not see the code as part of its BSA. Dean, I am happy to see the support for FH interoperability, but the devil is in the details. The channelization will make the problem harder with the higher chipping rate. One perspective is that when you are trying the interoperability mode, you drop to the narrower mode.

Ad, Do you want to use the different codes in a co-located system? No, you just get the cells closer.

Naftali, You mentioned the CMF, and I would like to know how it works with a limiting receiver. We need 4 bits with a hard limited receiver. The AGC would cost more time in the preamble.

Wes, Why does the CMF work? The CMF adds the multipath like a Rake receiver. The Matched filter and the equalizer is more like a canceller and more like an inverse filter. It takes much longer structures and more tap accuracy.

Chris, My notion is more general of what an equalizer is made of. Even if the receiver locks to the header, the data codes will cause the link to drop.

Mark,. If you look in a standard text, the sidelobes are not down much. How do you keep the sidelobes down after a saturated PA. The MSK is happy until you go into hard saturation. I am perplexed that the backoff is so low.

Mark, The diversity should get more performance. The other improvements take out much of what you could get from the diversity.

**Paper 8103, Alternate proposal to the Harris technique. Wes Brodsky, Raytheon**

The main difference is using OQPSK on the 8 chip per symbol modes. For the medium rate mode, we plan to use 16 chips per symbol which gives 6.875 MBps. This gives about 2.8 dB more sensitive for a 2 dB loss in throughput. This keeps the OQPSK mode working. The added mode for 16 CPS is small impact on chip count. For Noise, the change does not effect the performance. The lower rate mode is a little less than 5.5 MBps mode. We can get by with 3 dB less PA backoff due to the OQPSK. If we want to be backwards compatible, the preamble is the only problem. You can back off the preamble more or use another waveform of BPSK called offset BPSK. You can save .55 watts with this technique on TX. This is s 2 x lower power.

Ad, DFE requires a T/2 equalizer, will the combination of the two make the equalizer work harder to resolve the cross rail interference. Realign the channels before the DFE. That will make for self interference. If the delay is half chip, the two can be a problem.

Naftali, What type of equalizer did you test with? It had few FF and FB taps like 5. We think it will work with the offset channel. Your tables are full of 'like Harris' but did you do the simulations you self.

Carl, Our total BBP power is 0.1 watts, to the increase for 16-ary could not be 0.15 watts.

Tom Kolze, Why not use MSK? That increases the BW more.

**Motion** to extend the time to 7 PM to allow time for the (28-3-5)

**Paper 8082/83/84/85, Alantro proposal, Chris Hegard**

FEC is not overhead. Overhead is frame sync, preambles, and pilot tones. Redundancy is a function of the data and is used for reliability. Multipath is like filtering and you want to pick signal sets that have the maximum distance properties. Processing is composed of three terms. Binary Convolutional Coding on QPSK. Uses a 64 state BCC that takes 79-95 K gates. CDMA cell phones use a Viterbi decoder of 256 states. Has substantially more coding gain than other systems proposed.

Carl, What is the BW? The same spectrum as existing standard.

Greg, have you done any simulation in bursty error channel? All proposals will be hosed with microwave oven. The BCH code will not buy anything relative to Viterbi.

**March 1998**

**doc: IEEE P802.11-98/127**

Mark, On some of the performance curves you show both  $E_b/N_0$  and  $E_s/N_0$ , how do you explain which is used. Where the rate is 1 bit per symbol, the  $E_b/N_0$  is the same as  $E_s/n_0$ . What equalizer was used? It is sort of a DFE with sequence estimation embedded in it. We have a small trellis with delay.

John F., Is that description in your documents? No.

Mark, Is your proposal open to a reduced complexity scheme? This is our estimate of the complexity that we are going to use. It could easily be done with lower performance and complexity.

Mark, Have you talked to the FCC about your processing gain. No, but we are going to. In our view, the only SS system out there is the original one.

Greg2, Why not use a RS code over the packet?. When you get an error you toss the packet.

Jim, What you are saying is that PG is good for efficiency, but the FCC wanted to reduce efficiency. We can make a reasonable argument that the FCC will accept this. Robustness is what the FCC wants. SS is not possible, but is possible to get 10 dB of tolerance to interference.

Jim, Would you want to have the 802.11 to approach the FCC for approval of this technique. Yes. I think the Lucent technique is not

Naftali, What you call waveform gain, is not there. We have broken down the processing gain down in a different way.

Naftali, you do not have 30 MHz of BW, so you cannot use that for part of the gain.

Naftali, your curves for 25 and 50 ns should not be dropping like AWGN.

Naftali, I think the FCC will not accept your argument that this is PG. I tried to get the committee to use this and they did not want to do it.

Ad. Have you IP on this proposal. We are preparing on this code. We have submitted the IP statement.

Ad, what is the pipeline delay? In a packet based system this is not a problem.

Darrol, is the 11 MBps including the effects of the code rate? The raw rate is meaningless, the rate is 11 MBps.

???, Does the cell planning diagram show a frequency reuse of 3.

### **Thursday, 8:30 AM**

**Motion** to disqualify the following proposals as candidate PHYs for the 2.4 GHz high rate PHY as stated in the selection process document (Wes/Roy) (46-0-2)

The vote to disqualify is:

Alantro	70%
GBT	73.9%
Harris	4.4%
KDD	44.7%
Lucent	17.8%
Micrilor	6.4%
Raytheon	43.5%

357 valid votes were counted on 51 valid ballots, and none of the proposals were disqualified at this time.

William Roberts gave a review of the comparison matrix. Most had filled out the matrix completely.

Questions from William Roberts

Micrilor: FEC as an option? 8.7 Mbps uses FEC, not optional.

Alantro: Sensitivity, when will you provide more data? Will require some time.

KDD: Cost of SAW filter and multiple receive functions and the power required for multiple? Depends on the number produced. \$7 low volume, \$4-5 in 10K. power consumption less than 5 receivers. Could use one common PA.

Micrilor: Quantitative comparison of MSK and QPSK. Depends on the back-off. What percentage 10 to 50 %. Milliamps? 270 mA versus 70 mA.

Harris: 40K gate count estimate 2 tap feedforward 10 feedback.

GBT: 6 antennas? 128 usec standard 16  $\mu$ sec 11 evaluation. Enough time to read 6 antennas based on current preamble.

**March 1998**

**doc: IEEE P802.11-98/127**

Harris: Diversity versus equalization. Based on lab tests the algorithm 2 to 3 times throughput. 10x expected for equalization only.

Lucent: Co-channel detection scheme energy only?. Look at quality of signal also, implementation dependent.

Who would you back other than your own.

Alantro : Harris

Lucent: Unwilling to answer.

Raytheon: Power efficiency important. Only Micrilor has this.

Harris: Raytheon.

KDD: Similar to Lucent?

Micrilor: Not willing to be beaten until seriously injured.

GBT: Needs more time to review proposals.

## Questions from audience

Rollins: Equalization as part of the standard? Lucent: No implementation.

IP how to get; chip block diagrams, chips? Come see us.

Jan Haag: Japanese regulations?

Harris could depend on implementation of filtering

Raytheon: same as H

Lucent: same as current

Alantro: Should be ok.

Micrilor: selling product now

KDD: Approval previously.

Don Johnson: 15.147 requirements

GBT: 4 chips per symbol over 12 dB of processing gain.

Micrilor: Passed two years ago.

KDD: same as current PHY.

Harris: Talked to FCC. Rules passed spreading function. 9 dB + 1.6 passes the CW jamming test. FCC backs that test.

Raytheon: Same as Harris.

Lucent: Early in the process discussed with the FCC. Already have a written statement from the FCC.

Alantro: Academic attitude. Believes none are spread waveforms. Processing gain requirement. 3 dB more processing gain than the Harris proposal. 12.7 dB is the estimate. Jamming margin TBD. No honest answer based on questions with the FCC. Uncertain on how to do the measurement.

Greg Rawlins

for Micrilor: 3 channel system of 11 Mbps? Analysis of more than 3 AP with reuse of frequencies. Systems not modems. Not 2 or 3 is sufficient. Most somehow get isolation from base stations. Yes if you isolate. Must be a system level simulation.

Why do feel backward compatible not important CCA and demod 2 Mbps, do not want to use the long preamble.

Lucent: Explain why no loss in sensitivity between 8 and 10 due to overlapping symbols? Shift Barker into each other, more peaks within the time. ?? How is the signal space different? Why doesn't the distance be less? Overlapping modifies the signal space. At 8 shifting over each other 3 position spread. 10 shift the whole signal 2 chips. Addition of the parts.

Keith Lucent FEC on all of the data rates. Started the process at 8 Mbps.

Dean Lucent More information on the mode shifter and ???. November paper on PPM has a description. Talk to Lucent if you need more information. Has been fully described, mathematical. Can't implement.

Micrilor: Cover sequences auto and cross correlation's between sequences in the co-set. When you get some offset it is awful. Timing offsets? Showed all of the correlation of the codes in Montreal. Did it include timing offsets. Yes. Simulations tested multipath distributions and randomized code channel and data pattern. First four or five positions constrained.

Lucent and Micrilor: FH interoperability? Given and intent to include in proposal. Provide as a chip or what. DS backward yes, FH CCA. FH depends on the decision of the committee. Will it be mandated?

Lucent Open to have the FH interoperable in the proposal as an option in the standard.

Harris: Yes We intend to agree to design the function into the chip. If Dean provides.

Simon: Lucent Much of the work design and regulatory is at 8 Mbps. What is the impact of the 10 Mbps mode. Technical impact is moderate, same receive structure performance is a little less due to ISI. Regulatory symbol rate is going down a little bit CW Jamming test ok. Do you have evidence that they will accept? Must still talk to FCC, they still have 11 chip spreading.

Dean Micrilor. Using the different codes what is the rejection? Use 12 dB but is higher in some cases.

Greg; Lucent PA chosen as a 30 dBm what can transmit at 1 Mbps and then when switch to 10 Mbps how much. High speed at a 3 dB lower level than 1 and 2 Mbps. 4 dB in 1 and 2 Mbps. Add 3 for 10 Mbps.

GBT: With the cyclic shift of the Barker sequence. With timing offsets how do you resolve. Cover code randomizes. How long does the cover averaged? Long cover sequence. Both I and Q cover code think of as a randomizer.

## Questions from Williams

Micrilor Differential versus coherent; How much loss due to non-coherent and are cheap crystals available? , preamble increase required for differential. Very little loss due to differential. Selected a waveform that doesn't require lockup of loops. Gain is not worth the implementation. Doubling ?May be interesting. Picked 10 PPM because they cheap now. 10 PPM is at the limit at 16 Mbps.

Lucent Operate in backoff what is efficiency in the PA. 40 mW 350 mW

Lucent why is the FCC a question since they use 11 chips per symbol. Has to do with FCC interpretation of spreading or coding. What is calculated PG at 10 Mbps? 5 level signal in the Lucent what is impact of the linear amplifiers? Same amplifier but back off and loss efficiency.

Harris MPT requirement What is our 90% bandwidth? As measured on a spectrum analyzer. We measure BW of 13 to 14 MHz, depends on the SAW filter. Not necessary due to waveform. 22 MHz null to null? Why is the number higher than Lucent? Spectrums of both should be the same about 14 MHz. Lucent measured 1 Mbps at 10 MHz BW. Depends on bandwidth expansion. Why do they think then, that the 10 MBps mode with a symbol rate of 11/9 us, they will pass MTT?

All: Measurements by KDD based on bandwidth timing recovery and tracking 44 MHz. Do simulations take into account implementations.

Micrilor yes also lab.

Lucent Incorporated SPW not much difference.

GBT: No problems in lockup, modeled

Alantro: Involved in the design and implementation of many systems. DSP receivers for packet radio. May need to take 1 dB off

Raytheon Assumptions; saturated PA Rx and Tx filter included noise added sampling errors not included more work in May.

Harris: Simulating with real hardware. Data based on real radios. Simulations include real measured data. Results tracked earlier simulations.

Lucent: In light of wireline data rates going from 10 to 100 Mbps, Does the proposed approach address higher data rates? Ruled Out of order.

Chris: Spreading and coding. Current sample and then down sample, sufficient statistics to do an optimum detection. Minimum number of samples to do an optimum detector. Lucent Can't answer. Harris: Signal space? 1.375 Mbps needed with multibit samples.

Closing arguments.

Alantro: Processing Gain is important. Only Micrilor and Alantro meets PG requirements. Lucent will lose coding gain from 8 to 10.

Raytheon: Trms was without equalizer. Dead battery gives 0 Mbps. O-QPSK .4 W savings. 30 dBm 29 dBm average. Using Walsh coding. FCC ok. Backwards compatible with the FH and DS.

Micrilor: Code Channels important. Japan has only one frequency channel, so how can you work if you don't have code channels.

Lucent Barker code. Power back-off versus range. IP open. They will supply more detail including schematics, they will provide chips.

KDD: Meets Japanese regulations.

Harris Starting with existing product unequalized. Showed how equalizer can do more than 100 nSec. Low complexity. Nominal PA back-off. PCMCIA design ok. Uses existing RF/IF in the radio. Future implementations are being worked with greater levels of integration.

GBT Missing information in a new doc. Backward compatibility, variable data rates, match channel better. 10 % PER needs to be looked at. Proven technology in Rake receivers, future proof flexible.

**Motion** to disqualify the following proposals as candidate PHYs for the 2.4 GHz high rate PHY as stated in the selection process document , step 7

The vote to disqualify is:

Alantro	71%	
GBT	83%	x
Harris	29%	
KDD	79%	x
Lucent	48%	
Micrilor	31%	
Raytheon	60%	

total votes 385 in 55 valid ballots

Therefore KDD and GBT are removed from competition for the May meeting downselect.

Meeting adjourned.

May meeting in Utrecht

September meeting in Waltham MA.

## Tentative Minutes of the WPAN Ad Hoc Group Meeting

### Wireless Personal Area Network Ad Hoc Group Plenary Meeting Irvine, CA

9-13 March 1998

**Tuesday, 10 March 1998**

**1.0** The meeting was called to order at 8:40am in the Embassy Room by our Chairman Bob Heile.

Objectives for this meeting

Objectives of the Ad-Hoc Study Group

Objectives of the Study Group

**1.1 Roll Call:** People in the room were invited to introduce themselves.

**1.2 Secretary:** The Chair recognized Ian Gifford as the Secretary for the Ad Hoc Group meeting.

**1.3 Agenda Approval:** Bob Heile presented the following agenda for approval:

Ad Hoc Group Leadership

Chairman, B. Heile

Secretary/Minutes, I. Gifford

Objectives of the Ad-Hoc Study Group

Objectives of the Study Group

Review Functional Requirements

Review Five Criteria and Coexistence (2.4GHz) Criteria

Milestone Wearables WPAN PAR, etc.

Next Steps

Rick LaRowe made a motion to accept the agenda; Jon Rasmussen seconded it.

**2.0** Bob Heile presented the Monday March 9, 1998 Motion that was made during the 802.11 WG Plenary to form the Ad Hoc Group:

“Move to establish an ad-hoc group to look at the requirements of Personal Area Networking, and, if warranted, prepare a recommendation and motion for the 802.11 Plenary on Wednesday, March 11, 1998 to form a PAN Study Group with the charter of drafting a PAR for presentation at the next Plenary of 802.”

**3.0** Jim Carlo provided an extensive overview of 802 Study Group procedures as well as how to navigate the process from a Wireless Personal Area Networking (WPAN) point of view. In particular Jim suggested the Ad Hoc Group should:

- Draft a Motion for the Thursday March 12, 1998 802.11 WG Plenary to form a SG
- Progress the specificity of the WPAN Functional Requirements

- Draft a 2 paragraph Public Relations announcement on the WPAN SG; if approved.
- Draft a WPAN PAR for the July 1998 802 LMSC Plenary Meeting
- Considering joining or forming an Alliance, Forum, etc. for marketing the WPAN and the overall Wearable Computer standards effort.

**4.0** Vic Hayes provided inputs to our Wednesday WG Motion.

**5.0** Bob Heile then progressed the specificity of the WPAN Functional Requirements. This work consumed the group until we adjourned at 12:30pm.

**6.0** Bob Heile brought the meeting back to order at 2:00pm and continued to progress the specificity of the WPAN Functional Requirements. Additionally, we discussed the evening session of the Ad Hoc Group until we adjourned the meeting at 4:00pm.

**7.0** The evening meeting was called to order at 5:10pm in Salon E by our Chairman Bob Heile.

**8.0** Darwin Engwer presented an informal overview of his impressions of the WPAN SG effort as it relates to his experience of 802.11 MAC and PHY layers. Pat Thaler continued the discussion by providing an SEC perspective to the group. Vic Hayes reviewed our draft motion and help to clarify the next steps for the Ad Hoc Group.

Bob Heile adjourned the Ad Hoc Group at 6:15pm.

The Ad Hoc Group wishes to thank the 802.11 Working Group for their time and assistance in helping to form this new and important Study Group. We look forward to participating in the Working Group.

## Attendees:

LAST, FIRST NAME	MEMBER STATUS	COMPANY	TELEPHONE	E-MAIL
Borgstahl, Ron	Nonvoter	Motorola	+1 602-441-0825	ron_borgstahl@@e-mail.mot.com
Braley, Dick	Nonvoter	FedEx	+1 901-375-6535	rcbraley@fedex.com
Carlo, Jim	Voter	TI	+1 972-480-2524	jcarlo@ti.com
Case, Steve	Nonvoter	ViA	+1 507-663-1399	scase@flexipc.com
Dvorak, Joe	Nonvoter	Motorola	+1 954-723-4818	ejd023@email.mot.com
Ditch, Richard	Nonvoter	Motorola	+1 602-441-0861	rich_ditch-p26658@email.mot.com
Engwer, Darwin	Voter	Netwave	+1 510 737 1600	dengwer@netwave-wireless.com
Gifford, Ian	Aspirant	AMP	+1 978-442-4650	marketing@macom.com
Hayes, Vic	Voter	Lucent	+31 30 609 7528	vichayes@lucent.com
Heile, Bob	Voter	GTE	+1 617-873-4835	bheile@bbn.com
Kinney, Pat	Nonvoter	Intermec	+1 319-369-3593	kinneypw@norand.com
LaRowe, Rick	Nonvoter	GTE	+1 617-873-2193	rlarowe@bbn.com
Ochs, Larry	Nonvoter	Xetron	+1 513-881-3266	larryo@xetron.com
Rasmussen, Jon	Nonvoter	Intermec	+1 319-369-3508	rasmussj@norand.com
Reede, Ivan	Voter	Amerisys	+1 514-620-8522	i.reede@amerisys.com
Rypinski, Chandos	Voter	Lace	+1 707-792-5392	rypinski@microweb.com
Thaler, Pat	Voter	H-P	?	?
Vesuna, Sarosh	Voter	Symbol	+1 408-369-2657	saroshv@psd.symbol.com
Wils, Joris	?	3Com	+1 978-269-1317	joris_wils@3com.com
Wong, Jim	?	H-P	+1 408-746-5494	james-wong@hp.com
Zeglin, Chris	Voter	Symbol	+1 408-369-2667	chrisz@psd.symbol.com



**Submission to:  
IEEE P802.11  
Wireless LANS**

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Title: TGb REPORT FOR MEETING OF 03/09/98 TO 03/13/98 (Irvine CA)

Date: March 1998

Author: John Fakatselis  
Harris Semiconductor  
2401 Palm Bay Road  
Palm Bay, Florida  
32905  
USA  
Tel: (407)-724-7000  
Fax: (407)-724-7886  
email: jfakat01@harris.com

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**IEEE802.11 TASK GROUP B  
MARCH 1998 , IRVINE CA.  
AGENDA**

- **APPROVAL OF AGENDA. (MONDAY)**
- **APPROVAL OF JAN. 1998 MINUTES. (MONDAY)**
- **BACKGROUND (MONDAY)**
  - **SELECTION PROCESS OVERVIEW.**
- **TECNICAL PAPERS (MON., TUESD., WEDN.)**
  - **GENERAL**
    - **114**
    - **118**
    - **104**

■ 115

■ 100

■ PROPOSALS

■ 116 Proposal (Harris)

■ 79,80,81 (KDD)

■ 99,10r (Lucent)

■ 117 (Micrilor)

■ 103 (Raytheon)

■ 90-93,101,102 (GBT)

■ 82-85 (Alantro)

■ SELECTION PROCESS (THURS.)

■ 2. Elimination of the proposals with incomplete data and/or a fundamental problem not meeting the criteria.

■ 3. Establish a comprehensive comparison benchmark matrix based on the evaluation criteria.

■ 4. Presentation of the matrix to the task group.

■ 5. Last opportunity for questions by the participants.

■ 6. Closing arguments by each proposer.

■ 7. Exclusion of proposals based on 75% vote to eliminate.

■ NEXT MEETINGS AGENDA

**TASK GROUP SCHEDULE TO COMPLETION.**

- **Jan. 98**
- **March 98**  
Beginning of proposal down selection process.
  
- **May 98**  
Final Modulation selection.
- **July 98**
- **Sept. 98**  
Draft complete, Submit working group ballot (1)
- **Nov. 98**  
Submit working group ballot (2), if required.
- **Jan. 99**  
WG ballot resolution meeting, submit to working group confirmation ballot
- **March 99**  
Motion to submit sponsor Ballot
- **May 99**  
Sponsor Ballot resolution meeting ,Submit sponsor confirmation Ballot
- **July 99**  
Sponsor confirmation ballot resolution meeting, Submit to Standards board.
- **Sept. 99**  
Standards board approval OR Sponsor confirmation Ballot backup and submit to Excom e-mail ballot for submittal to standards board.
- **Nov. 99**
- **Dec. 99**  
Approval

**PROPOSALS AT THE MARCH 1998 MEETING**

<b>ALANTRO</b>	
<b>GOLDEN BRIDGE TECHNOLOGY</b>	<b>Advanced Barker Direct Sequence</b>
<b>HARRIS SEMICONDUCTOR</b>	<b>M-Mary Bi-Orthogonal Keying</b>
<b>KDD</b>	<b>Carrier Frequency Offset-Spread Spectrum (CFO-SS)</b>
<b>LUCENT TECHNOLOGIES</b>	<b>BCPM, Barker Code Position Modulation</b>
<b>MICRILOR INC</b>	<b>16-ary Differential Bi-Orthogonal Keying (16-ary DBOK)</b>
<b>RAYTHEON</b>	<b>Offset Quadrature Bi-Orthogonal</b>

**SELECTION PROCESS STEPS DURING THE MARCH  
MEETING AS OR DOC. 98/54.**

■ **2. Elimination of the proposals with incomplete data  
and/or a fundamental problem not meeting the criteria**

:

This step will be accomplished by a secret vote at the task group level. If a proposal receives by a vote of 75% or more an incomplete status , it will be disqualified from further consideration.

The task group recommendation will be forwarded to the IEEE802.11 meeting for approval.

■ **3. Establish a comprehensive comparison benchmark  
matrix based on the evaluation criteria.**

A team of reviewers (not representing a proposal on the table) will be assigned to develop and present this comprehensive comparison matrix to the task group . The compilation of the matrix will start before the March meeting. The matrix will be available on the reflector 2 weeks before the meeting.

This team will work with the proposers during the March meeting to complete and to fill in the data for each proposal represented on the matrix.

Each proposer is required to submit the corresponding data for the proposal they represent.

**■ 4. Presentation of the matrix to the task group.**

The presentation will be given by the team responsible to compile the matrix.

The proposers will have the opportunity to make clarification points regarding the entries of their own proposal on the matrix.

**■ 5. Last opportunity for questions by the participants.**

The task group participants will have a last opportunity to question the proposers.

Questioning will begin with the members of the team that was assigned to compile the comparison matrix.

**■ 6. Closing arguments by each proposer.**

After the final questioning each presenter will be given time for the closing arguments regarding their proposal.

**■ 7. Exclusion of proposals based on 75% vote to eliminate.**

This is a secret voting process at the task group level. The question will be for elimination of proposals. Any proposals that receive 75% or more will be disqualified from further consideration.

The result of the vote will be forwarded to the IEEE802.11 group as a recommendation for approval .

This is the last action of the downselection process for the meeting scheduled during March of 1998.

The time between the March and the May meetings is an opportunity for the remaining proposals to consider combined approaches to reduce the number of competing solutions.

**MOTIONS / BALLOTS.**

The following secret ballots were circulated for the corresponding motions shown on the ballots:

**DOWN SELECTION BALLOT  
TASK GROUP b**

**Motion to disqualify the following proposal (s) as candidate PHYs for the 2.4 GHZ high rate PHY as stated in the selection process document (98/54) step 2.**

**VOTING BALLOT:**

**Indicate your vote by checking the appropriate box. One check per row.**

<b>PROPOSAL</b>	<b>YES (Disqualify)</b>	<b>NO (Do not disqualify)</b>	<b>ABSTAIN</b>
<b>ALANTRO</b>			
<b>GBT</b>			
<b>HARRIS</b>			
<b>KDD</b>			
<b>LUCENT</b>			
<b>MICRILOR</b>			
<b>RAYTHEON</b>			

**DOWN SELECTION BALLOT  
TASK GROUP b**

**Motion to disqualify the following proposal (s) as candidate PHYs for the 2.4 GHZ high rate PHY as stated in the selection process document (98/54) step 7.**



**VOTING BALLOT:**

Indicate your vote by checking the appropriate box. One check per row.

<b>PROPOSAL</b>	<b>YES (Disqualify)</b>	<b>NO (Do not disqualify)</b>	<b>ABSTAIN</b>
<b>ALANTRO</b>			
<b>GBT</b>			
<b>HARRIS</b>			
<b>KDD</b>			
<b>LUCENT</b>			
<b>MICRILOR</b>			
<b>RAYTHEON</b>			

**SECRET VOTING PROCESS:**

- **WATERMARKED BALLOTS WILL BE GIVEN TO VOTING MEMBERS ONLY.**
- **VOTING MEMBERS MUST PRESENT VOTING TOKEN AND PLENARY MEETING BADGE TO RECEIVE BALLOT.**
- **BALLOT WILL BE FILLED IN PRIVATE AND FOLDED BY VOTER.**
- **VOTER WILL PRESENT TOKEN AND THEN DEPOSIT THE FOLDED BALLOT AT THE EXIT OF THE ROOM WHICH WILL BE MONITORED BY IEEE802 STAFF (CCI).**
- **VOTER WILL EXIT THE ROOM. A COUNT OF PARTICIPANTS EXITING THE ROOM WILL BE MADE.**
- **AFTER RECEIPT OF ALL VOTES FROM PRESENT MEMBERS THE VOTES WILL BE COUNTED BEHIND CLOSED DOORS BY THE BALLOT GROUP (802.11 OFFICERS, CCI EMPLOYEE).**
- **NO LATE VOTES WILL BE ACCEPTED AFTER VOTE COUNT BEGINS.**
- **INCORRECTLY FILLED BALLOTS WILL BE VOIDED.**
- **RESULTS WILL BE ANNOUNCED TO THE TASK GROUP.**

**ON BEHALF OF TASK GROUP B THE FOLLOWING  
MOTIONS WERE FORWADED AND PASSED TO THE  
PLENARY:**

**1. TO ACCEPT THE RESULTS OF THE GROUPS SECRET  
BALLOT AS ANNOUNCED BY THE BALLOT GROUP.  
THIS IS PART OF THE SELECTION PROCESS STEP 2  
IN DOCUMENT 98/54.**

**NOTE: NO PROPOSAL ELIMINATED.**

**VOTE :38-0-1**

**2. TO ACCEPT THE RESULTS OF THE GROUPS SECRET  
BALLOT AS ANNOUNCED BY THE BALLOT GROUP .  
THIS IS PART OF THE SELECTION PROCESS STEP 7  
IN DOCUMENT 98/54.**

**NOTE: THE GBT AND KDD PROPOSALS WERE  
ELIMINATED AS A RESULT OF THE VOTE.**

**VOTE: 40-0-2**

## Teller's report TGb ballot 1

Proposal	Yes	NO	Abs	Perc	Total
Alantro	28	12	11	70.0	
GBT	34	12	5	73.9	
Harris	2	43	6	4.4	
KDD	21	26	4	44.7	
Lucent	8	37	6	17.8	
Micrilor	3	44	4	6.4	
Raytheon	20	26	5	43.5	
Total	116	200	41		357

## Teller's report TGb ballot 2

Proposal	Yes	NO	Abs	Perc	Total
Alantro	37	15	3	71.2	
GBT	45	9	1	83.3	
Harris	15	37	3	28.8	
KDD	42	11	2	79.2	
Lucent	25	27	3	48.1	
Micrilor	16	36	3	30.8	
Raytheon	30	20	5	60.0	
Total	210	155	20		385

## 802.11c Summary Report

- Met Tuesday March 10, 1998
- Six editorial comments against 802.11c/D2 all accepted.
- Resulting Document 802.11c/D3
- 802.11c liaison meeting with 802.1 results
  - review of 802.11c/D2 - no problems found, no comments
  - 802.1 will forward 802.11c/D3 to ISO for inclusion in 802.1D (ISO 8802-1) as US comment
- Revision 802.11c/D3 to 802.1 working group to review during this plenary session.
- Given comments are editorial would like to make a motion to send 802.11c/D3 direct to sponsor ballot.

## Report From 802.11rev Ballot Resolution Meeting

- Received 38 comments (7 commenters, 2 NO votes)
  - Big T technical: 6
  - Little t technical: 8
  - Editorial: 24
- Of the 14 technical comments 10 were editorial comments masquerading as technical comments.

## Results

- All comments were processed
- 802.11revD2 was updated to reflect the comment processing
  - 802.11revD3 contains change bars
  - 802.11revD4 is identical to 802.11revD3 with all changes accepted
- One No voter has changed his vote to YES
- One No voter remains

## Remaining Comments (1)

- The proposed replacement for appendix D has all the MIB attribute names changed to be preceded by “dot11”.
  - I have seen no justification given for this. I thought we were supposed to be fixing errors not changing things to be the way we think they should have been originally. The effect of making this change to all the MIB attribute names referred to in the current 802.11 standard is that the entire standard document has to be edited by the IEEE editor not for formatting but for content. I personally cannot vote yes on a change of this magnitude without seeing the modified text and verifying that the changes have been made in the appropriate places.
  - I would be more than happy to withdraw this comment if someone can give me a good reason why I should. Modify the new text for appendix D to coincide with the attribute names as defined in clause 11 of the current standard.

## Response to Comments (1)

- This is not a technical comment. The text to which the commenter refers was not changed in the draft for this ballot and can not be used as the basis of a NO vote. To address the comment made, the names of the attributes were changed to conform to the SNMPv2 SMI style of management rather than the ISO GDMO style, since the vast majority of network management in use is of the SNMPv2 SMI type.

## Remaining Comments (2,3,4,5)

- If the change in clause one has been applied, no reference to aListenInterval exists in 7.3.1.6
  - Replace aListenInterval with dot11ListenInterval
- If the change in clause one has been applied, no reference to aSlotTime exists in 9.2.4
  - Replace with **Clause 9.2.4, fifth paragraph, change:** “dot11SlotTime = The value of the correspondingly named MIB attribute.” **into:** “aSlotTime = The value of the correspondingly named PHY characteristic.”

## Remaining Comments (2,3,4,5)

- If the change in clause one has been applied, no reference to aSIFSTime or aSlotTime exist in 9.2.10
  - Replace with **Clause 9.2.10, first paragraph below Figure 58, change the following sentence:** “dot11SIFSTime and dot11SlotTime are defined in the MIB, and are fixed per PHY”. **so that it reads:** “aSIFSTime and aSlotTime are fixed per PHY.”
- If the change in clause one has been applied, no reference to aMACPrDelay exists in 9.2.10
  - Replace with **Clause 9.2.10, second paragraph below Figure 58, in the equation for aSIFSTime, change** “dot11MACPrDelay” **into** “dot11MACProcessingDelay.”



## Response to Comments (2,3,4,5)

- This is not a technical comment. Instruction number 1 will be augmented with a list of the attribute names to be changed.

## Remaining Comments (6)

- This seems to me to be another case of how we think we should have done the standard in the first place, and is not intended to fix errors in the current standard.
- Leave the PHY “characteristics” as MIB attributes unless something is broken.

## Response to Comments (6)

- The proposed change is a direct result of an interpretation request received by the IEEE. This change addresses that interpretation request. This is not a technical comment on the proposed change.

## Motion

- To accept 802.11rev/D4 and forward to the 802 Executive Committee for an LMSC Sponsor ballot.
- Passes: 33-1-4

# Report of Wireless PAN Ad Hoc Group

Tuesday, March 10, 1998

# Report of Wireless PAN Ad Hoc Group Summary

- WPSG Meeting Leadership:
  - Chairman, B. Heile
  - Secretary/Minutes, I. Gifford
- Objectives of the Ad-Hoc Study Group
- Objectives of the Study Group
- Reviewed Functional Requirements
- Reviewed the five criteria
- Established Milestone for WPAN SG

## Report of Wireless PAN Ad Hoc Group Summary

- Drafted motion and Officer recommendations for SG
- Press Release
- Next Steps

## Next Steps/Milestones

- 3/9-13/98 SG Request for approval
- Establish IEEE reflector
- 4/8-9/98 SG Meeting - Cambridge, MA
- 5/4-7/98 SG Meeting - Interim Meeting Utrecht
- 5/20-21/98 SG Meeting - ?
- 5/22/98 PAR Submittal
- 7/6-10/98 Plenary - La Jolla, CA

March 1998

doc.: IEEE 802.11-98/135

## Wearable Computer Standards Archive and Reflector \*

- <ftp://ftp.flexipc.com/wearablesgroup>
- [wearablesgroup@flexipc.com](mailto:wearablesgroup@flexipc.com)

The Wireless PAN Study Group plans on joining  
the IEEE [stds\\_802\\_pan@majordomo.ieee.com](mailto:stds_802_pan@majordomo.ieee.com)

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\*c/o Steve Case, ViA, 507-663-1399, [scase@flexipc.com](mailto:scase@flexipc.com)

Ian Gifford, M/A-COM

March 1998

doc.: IEEE 802.11-98/135

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## Objectives of SG

- Review WPAN/WLAN Requirements
- Determine Need for Standard
- If warranted draft a PAR for submittal
- Seek appropriate Sponsorship within 802

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Submission

Slide 6

Ian Gifford, M/A-COM

## Motion

- Move to form a Wireless PAN Study Group under 802.11 with the charter of drafting a PAN PAR for presentation at the next Plenary of 802.
- Chair: Dick Braley
- Vice Chair: Bob Heile
- Secretary/Tech Editor: Ian Gifford