

Tentative Minutes of the IEEE P802.11 Working Group

**Interim meeting
San Jose, California
January 9-12, 1995**

Monday, January 9, 1995, AM

The meeting was opened by Vic Hayes¹⁾ at 0845. Wayne Moyers gave a brief description of, and an introduction to the San Jose area. Vic Hayes thanked the organisers for their efforts. Peter Chadwick volunteered to take minutes for this particular meeting. Leon Scaldefferri managing the attendance record, Wayne Moyers controlling the pigeonholes and Wim Diepstraten collecting originals of documents.

Objectives for this meeting

- start work on test documents
- review Management Information Base
- Informative annex
- work on "to be determined" items

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1. Opening

1.1 Roll Call: Participants introduced.

1.2 Voting rights: 1.3 Attendance list, Registration, 1.4 Logistics: The chair described the rules for participation, the methods of attaining voting rights, and the logistics of the meeting. Wim Diepstraten volunteered to look after the logistics of maintaining the document list, providing document numbers, and holding the master paper copies. The responsibility for providing the 70 copies lies with the originator of the document. Wayne Moyers volunteered to look after document distribution.

1.5 Other announcements:

1.5.1 FCC The chair informed the meeting that the FCC had issued an NPRM for spectrum use above 40 GHz. Input for the standing regulatory committee was requested. Peter Chadwick suggested that commonality with the CEPT T/R 22-04 recommendation of the allocation of 59 - 62 GHz would be advantageous.

1.5.2 Schedule The chair suggested that a revision of the Schedule for progress in production of the standard be conducted on Thursday Jan 12th. The question was raised about time scales for even higher speeds: Chandos Rypinski queried the applicability of the current MAC, while Wayne Moyers felt that a schedule should be produced. The time scales were considered to be somewhat tight, in view of the re-balloting that will be required after the March meeting.

2. Approval of the minutes of the previous meeting

2.1 Lake Tahoe meeting (subject to quorum) 11-94/281 As a quorum was not present, this approval is held over until the next meeting.

2.2 Matters arising from the minutes There were no matters arising from the minutes.

3. Reports

3.1 Report from the Executive Committee, The Chair reported that the Executive Committee had approved the issue of the Press Release: this had been done. 802.1 were changing the 802 Functional Requirements; Vic Hayes requested volunteers to represent 802.11 at the meeting which will take place in March. 802.11 comments to the FCC have been made. The Executive Committee of 802 wish a response to ETSI to be made: the Executive Committee will respond with a holding message. Wayne Moyers asked for opinions on the advisability. Peter Chadwick suggested that such an approach could well cause a degree of antipathy, and will do little good, in view of the major differences existing between the ETSI Hiperlan MAC requirements, and the 802.11 MAC. The Chair said he would set up a conference call with Don Loughry to discuss this.

3.2 from editors The editors submitted the D1 draft one day ahead of schedule.

3.3 from simulators No report was delivered on simulation activities. Barry Dobyms suggested that the simulation committee had done little work, and the committee be disbanded. After discussion, it was agreed that the work needed to be done, but a problem existed with the IPR issue regarding the programme that Apple Computer Inc. had provided, insofar as any changes and modifications to that program had to be given back to Apple Computer Inc. Additionally, it was pointed out by Rick White that the agreement offered by Apple Computer Inc. provided no protection in the event of legal action by a third party against users of that software. It was stated that a number of problems existed with that particular software. A request for volunteers to assist Barry Dobyms with proposals for reference to a meeting later in the week.

4. Registration of contributions The 1994 document list was reviewed, and closed. Refer to doc: 95/12 for the list of relevant documents.

5. Adoption of the Agenda It was suggested that some informal discussions on the draft d1 of the standard would be useful, and this was accepted. The format would be a 20 minute introduction to each area, followed by a 20 minute

discussion. Dave Bagby requested that such activities should be informal, and outside the formal proceedings of the committee. Barry Dobyms suggested that some work on making all the different PHY's consistent would be useful: Dave Bagby disagreed.

Ed Geiger felt that open issues could be worked on, while Michael Fischer generally supported the position of Dave Bagby, although agreeing that areas which are not included in the current draft are available for work. Jim McDonald queried the amount of time necessary for assimilation and review of the Letter Ballot Comments: it was suggested by Vic Hayes that work start on the Saturday previous to the start of the formal March meeting of the 802 committee. It has been suggested that an Informative Annex describing the background of the standard be produced: this did not receive support.

After much discussion, the Agenda was then accepted until the end of Tuesday: remainder of Monday in the four groups: MAC, DS, FH and IR, Tuesday start with full WG, followed by MAC/PHY on harmonization, then followed by the 4 subgroups; while the activities for Wednesday and Thursday will be defined later.

6. Unfinished Business

6.1 Hiperlan status Peter Chadwick reported that the ETSI Standard for Hiperlan was to receive final editing during the week starting 16 January, ready for presentation to the ETSI TC-RES committee at its meeting in Istanbul during the week beginning February 6th. The Standard is expected to be issued for Public Inquiry during March, and to be fully available at the end of 1995.

6.2 Informal discussion D1 No discussions were held.

7. New Business

7.1 Conformance Testing Requirements The Chair introduced the ISO/IEC conformance Test Requirements. In discussion. it was stated that ISO/IEC Test Specifications do not exist for all other LANs.

Peter Chadwick pointed out that the test suites and methods must allow suitable stimulation of the equipment under test to allow Type Approval testing for regulatory purposes, and queried the total applicability of the ISO/IEC Information Technology methods where radio equipment were concerned. Michael Fischer queried which of the other 802 standards met these requirements. It appeared that not all other 802 sub committees had gone through the ISO/IEC route, the Chair felt that the PICS Pro-forma should be added to the standard.

Barry Dobyms felt that the PICS Pro-forma was easier to produce than the Standard! Ed Geiger felt that it would be premature to start working on the PICS Pro-forma before the Standard is more stable. Much discussion followed about the applicability of test suites, and regulatory requirements. The question was asked if PHY testing was required: one speaker said that it was necessary, while Jerry Loraine pointed out that the system had to be tested as a whole. It was agreed that some testing specification was required. John Hayes felt that the control was necessarily specified at the top of the MAC, while monitoring could take place at the bottom of the PHY as well as the top of the MAC. He felt that even so, a lot of control was lost. Jim McDonald pointed out that the resources did not exist to produce an adequate overall conformance test spec., and suggested that a practical test that allowed evaluation under certain specified conditions may be more applicable. He wondered if enhancing the basic standard may provide a better result. John Hayes suggested producing a full list of all the parameters that could be tested, and then select the ones required. It was agreed that testing should be "black box" overall testing. Paul Struhsaker felt that some external signals would have to be made available for regulatory testing. Jim McDonald asked if testing was not to be done by the manufacturer, and that self certification was applicable? Peter Chadwick said that a common test method was necessary so that even though self certification was applicable, a common level ground was desirable. Wayne Moyers felt that all 802.11 compliant devices should be able to inter-operate if the standard was to be useful. However, he pointed out that combinations of all possible MAC and PHY implementations may not be able to inter-operate under some conditions. Jerry Loraine felt that three possibilities were under discussion, viz.:-

* What type of conformance specs do we want? (e.g. an ISO Test Suite or an Appendix?)

* The form of the testing (e.g. black box testing or exposed interfaces)

* What functionality is to be tested (Specific tests to guarantee functionality:

are there different levels of 802 compliance)

Nathan Silberman felt that other standards required specific test methods and test elements, and this required definition.

Larry Zuckerman said that tests should be defined to ensure commonality.

● Paul Struhsaker suggested that a start should be made with an Annexe. Jim McDonald felt that it could be included within the Standard. Paul Struhsaker felt that the documents should be separate, as the inclusion of the test spec would slow down the production of the standard. Barry Dobyns said that the PICS Pro-Forma should be included in the standard. After discussion, it was agreed that the test spec should not be in the standard, and that the decision should be made later as to whether or not the document should remain an Annexe or become a separate document. It was decided that the conformance requirement be defined at this meeting in terms of functionality so that the physical implementation of what has to be provided, the PICS Pro-Forma is required for the sponsor ballot, and that the parameters to be tested can be defined.

Motion # 1: *That We will make the conformance requirement starting the January 1995 meeting in terms of functionality so that*
 - we know what people have to build
 - the PICS is easily obtained; the PICS is required for sending the draft basic standard to Sponsor. and
 - we know what we want to test

Moved by: Barry Dobyns

Seconded by: Paul Struhsaker

Approved: 22 Disapproved: 3 Abstain: 1 Motion # 1 passes as recommendation

This recommendation will have to be confirmed at the next meeting.

Motion # 2: *that the conformance test specification be treated as a separate document subject to merging with the main standard at a later date, and not earlier than the basic draft going to Sponsor ballot.*

Moved by: Paul Struhsaker

Seconded by: Peter Chadwick

During discussion, a straw poll on the inclusion of the test specification within the documentation offered for sponsor ballot showed 3 in favour. Proposed by Jeff that the motion be amended to read "at a later date, and not earlier than the Sponsor ballot". This amendment was accepted by the proposer and seconder. Jim McDonald felt that the motion demanded a conformance test specification, which was not totally agreed.

Approved: 17 Disapproved: 3 Abstain: 6 Motion #2 passes as recommendation

The subject of the form of the testing was discussed. John Hayes said that testing an exposed interface imposed some implementations. Barry Dobyns argued against exposing any interfaces other than those absolutely necessary. Ed Geiger said that in the standard, some mention was made of an exposed DCE/DTE interface. Paul Struhsaker said that both the DS PHY had requirements for exposing certain interfaces for the purposes of conformance testing. He said that precedence exists for this approach in various telecom specs. Michael Fischer said that the determination of the conformance to the 802.11 PAR in any particular implementation if there were no exposed interfaces below the LLC was indeterminate. Jim McDonald said that he felt that the testing needed to take place at the air interface, and therefore an exposed interface was unnecessary.

Larry Zuckerman said that two sets of test were needed - one for the transmitter, and one for the receiver.

Vic Hayes proposed an adjournment at 1555 to allow for informal discussion of harmonisation of the standard. Paul Struhsaker proposed continuation of the discussion; this was agreed.

Motion # 3: *conformance testing be performed in a "black box" configuration, with the exception of any signals required for regulatory approval or those specified in the draft standard*

Moved by: Paul Struhsaker

Seconded by: Barry Dobyms

Motion #3 discussion: Question called by acclaim.

Approved: 22 Disapproved: 2 Abstain: 2 Motion 3 passes as recommendation

Proposed that the individual groups define the tests which they wish to perform.

Barry Dobyms presented for information the early pages of the PICS Pro-Forma for IEEE 802.3, with an explanation of the format.

7.2 Simulations work discussions deferred till after an ad-hoc group lead by Barry has had an opportunity to review this subject.

7.3 Comments on ET Docket 94-124 discussions deferred till after an ad-hoc group had met.

7.4 Response to ETSI discussions deferred till after an ad-hoc group had met.

7.5 FH and DS submissions assigned to the PHY group meeting.

7.6 Harmonization assigned to a combined MAC/PHY group meeting.

8. Adjourn for subgroups Moved to adjourn to 0900 Jan 10. Proposed Michael Fischer, seconded John Hayes, carried by acclamation.

Tuesday AM January 10, 1995

Meeting opened by Vic Hayes at 0915. The Chair reviewed the previous day's work, and announced that Barry Dobyms was unable to attend because of the difficulties incurred by the inclement weather conditions. It was decided to leave the matters of simulation until Barry Dobyms and Kerry Lynn were available. It was proposed that the meeting proceed with the harmonisation issues raised on the previous day, work in sub groups until 1200 on Wednesday Jan 11th, and reconvene at 1330 Jan 11th. This was agreed.

Paul Struhsaker presented the DSSS system. He pointed out that each PHY had a different PLCP because of the different requirements imposed by the individual technologies. Ed Geiger stated that the texts for FH and PHY implementation of 16 bit CRC were different, where harmonisation should lead to the use of the same text. Some discussion followed, with some suggestion that commonality of the MIB would provide harmonisation. A suggestion was made that a joint PHY session could provide the list of common MIB parameters. Ed Geiger said that the SIFS should be defined such that MAC and PHY timings were separated. Paul Struhsaker proposed

Motion # 4: *That in a joint MAC-PHY session, the common MIB objects be found, defined and harmonised, and common texts be similarly so harmonised. This work will include the equations for the calculation of the associated MAC protocol timings*

Moved by: Paul Struhsaker

Seconded by: Wim Diepstraten

Motion #4 discussion: Question called by Wayne Moyers, seconded Leon Scaldeferri.

Approved: 20 Disapproved: 1 Abstain: 1 Motion #4 passes as recommendation

Move to adjourn to 1330 Wednesday.

Proposed Dean Kawaguchi, Seconded Leon Scaldeferri.

Wednesday PM January 11, 1995

9. Opening The meeting was called to order by the chairman, Vic Hayes, at 1350.

9.1 Roll Call The participants introduced themselves.

9.2 Document list update Wim mentioned that he only made a reservation for Larry and for Michael.

9.3 Agenda adjustments

The chair proposed the following agenda:

- 10.1 Conformance testing
 - MAC Report
 - DS Report
 - FH Report
- 10.2 Simulations work
- 10.3 Comments on ET Docket 94-124
- 10.4 ETSI response
- 10.5 Harmonization
 - MAC/PHY report

The Agenda as proposed by the Chair was adopted

9.4 Announcements

9.4.1 closing date of ballot The Chairman announced that the date for the return of the Ballot has been extended to January 25th, this being the date of postmark, delivery to the courier service or whatever, or the date of FAX or e-mail.

10. MAC/PHY (interface) Issues

10.1 Conformance testing

MAC report Kerry Lynn reported on the MAC group meeting, which discussed some of the problems with the Privacy Algorithm within the current standard. The work so far has predicated the use of the 802.10 STE, but the use of a sub set of the 802.10 STE is considered to be more applicable, especially as a full 802.10 STE may be additionally applied. This, and the following comments will be made as recommendations to the March meeting; they may well also be made as letter ballot comments.

It was also considered that if privacy is optional, a flag in the MAC header should be reserved for indication of the presence or otherwise of encryption.

Additionally, privacy is only applied to the MSDU, not to the MAC header.

The MSDU will not be passed to the LLC if the ICV does not check.

A default ESS wide Base key is assumed - this permits implicit authentication.

Any station in possession of the default key is considered pre-authenticated.

The chair queried the passing of a packet to the LLC even if the ICV does not check. Kerry explained that if there is a failure, it is undesirable to pass the packet to the LLC, albeit it that in multi-media applications, such as video, it may be desirable to pass the packet on even if the packet is in error. Michael Fischer commented that such action could reduce the effectiveness of the Privacy algorithm.

Dave Bagby felt that more than one bit was needed to indicate the privacy on/off function: Michael Fischer disagreed.

DS PHY group report Paul Struhsaker reported that the DS group had taken an informal approach, and had concluded that the options were of power levels and antenna diversity. Some discussion had followed, and the DS PHY was looking to test sensitivity over all channels at temperature extremes. Peter Chadwick asked if the group were mandating exposing interfaces for testing; Paul replied that some external interfaces were necessary for checking some parameters, such as modulation accuracy. Jim McDonald asked if the measurement of modulation involved the use of a reference transmitter/receiver; Paul said that the use of a modulation analyser was intended. Jerry Loraine asked if the receivers were to be tested in static or dynamic fashion. Paul responded that there effectively would be dynamic BER testing.

FH group report Jim McDonald reiterated the report given before lunch to the joint MAC-PHY group: for details, the minutes of that meeting should be referred to.

10.2 Simulations work The problem of the Simulation Committee was raised again. Barry Dobyns reviewed the situation.

Motion # 5: *move to discharge the Simulations Committee*

Moved by: Barry Dobyns

Seconded by: Kerry Lynn

Motion #5 discussion: Wayne Moyers asked Barry to explain why the committee should be discharged. Barry explained that there had been no results from the committee. Kerry Lynn said that the committee consisted of volunteers, and that there was a limitation on the time available, while Apple Computer Inc. had dedicated a lot of resource to the problem. Kerry added that where there had been questions about the Licensing Agreement, communications with the Apple Computer Inc. Legal Department had been able to assist in a number of cases. Jim McDonald suggested that there would be an advantage in postponing discussion until some further consideration could be given.

Motion # 5.1: *postponement until the March meeting*

Moved by: Jim McDonald

Seconded by: Wayne Moyers

Motion # discussion:

Approved: 17 Disapproved: 0 Abstain: 8 Motion 5.1 passes

Motion 5 postponed

10.3 Comments on ET Docket 94-124

Wayne Moyers said that he felt that this was not a matter where 802.11 could comment. The Chair reminded the meeting that the CEPT allocation had been mentioned. Wayne Moyers said that he felt that this allocation was not applicable to Wireless LANs. It was decided to take no action.

10.4 ETSI response

The Chair reported that he had discussed the ETSI Liaison Statement with Don Loughry, and that he would be investigating the matter further.

10.5 Harmonization MAC/PHY report

The Chair brought to the meeting the recommendations of the Joint MAC-PHY Group regarding the MAC timings.

Motion # 6: *That all compliant units will meet the medium-xIFS timing requirement and will calculate its implementation dependent MAC-xIFS from the equations to be defined. (x equals S, P or D)*

At the MAC/PHY group moved by Dean, Ed seconded, passed with 25 support, 0 oppose, 2 abstention.

Moved by: Wayne Moyers

Seconded by: Wim Diepstraten

Motion # discussion:

Approved: 21 Disapproved: 1 Abstain: 4 Motion #6 passes as recommendation

Motion # 7: *That we use a (one way) medium propagation delay (that is aChannel_Transit_Delay) of 1 micro-second in the FH-PHY and DS-PHY to calculate the medium SIFS and slot-times and 5 micro-seconds to calculate the MAC acknowledge time-out.*

At MAC/PHY group moved by Dean Kawaguchi, seconded by Michael Fischer, passed with 19 supporting, 1 opposing, 7 abstaining.

Moved by: Jim McDonald

Seconded by: Dean Kawaguchi.

Motion # 7 discussion: none

Approved: 19 Disapproved: 4 Abstain: 1 Motion passes as recommendation

9.4.2 Recognition The Chair thanked the Editors for their efforts in getting the Standard edited early, and made presentations to them. Wayne Moyers and Pete Farmer were thanked for their efforts in organising the meeting.

13. Adjourn meeting Move to adjourn until 1300 Thursday 12th Jan 1995. Proposed: Barry Dobyms, Seconded: Dean Kawaguchi.

Thursday afternoon January 12, 1995

14. Opening Chair, Vic Hayes, opened the meeting at 13:10

14.1 Announcements none

14.2 Document list update the chair announced the updates.

14.3 Agenda adjustments There being no dissent, the Agenda was adopted.

15. Reports

15.1 MAC report There was no formal report, as none of the officials of the MAC Group were available. It was believed that there had been no change since the report to the previous meeting.

15.1 PHY report Jim McDonnell reported on the progress of the FH Group; he had had no inputs from the IR. or DS groups.

Input papers on testing should be made available by the March meeting, although they may not be discussed at that time.

Submissions are requested on testing, including the testing in static or hopping modes. Jim McDonnell will post this request on the reflector, as also the question of conducted v. radiated RF tests.

Jim reported that there were two arguments made regarding temperature range, viz., manufacturers declaration or fixed temperature range(s).

A discussion has been held on the MIB. Consensus was reached that each PHY Group would need its own MIB table, although terminology involved such reach as high a degree of commonality as possible.

Certain of the MIB parameters have been deleted, as they are unnecessary for interoperation, although necessary for actual equipment design.

Wayne Moyers will promulgate the submissions previously made on the maximum number of MPDUs for the various rate PHY's.

There was some inconclusive discussion on the inclusion of all MIB parameters in one table. Ed Geiger will talk to the IR., DS and MAC Groups about this.

ACTION: Ed Geiger.

It was reported that the IR. Group had started looking at the PICS Pro Formas and Conformance Test Specification. No attendees from the DS Group were present. Thus there is no report.

16. Unfinished business

16.1 Recap of output documents There were none

16.2 Recap of document distribution all documents would be distributed.

16.3 Next Meeting

* **Objectives for next meeting** The Objectives for the March meeting were stated to be the analysis of ballot returns, and possibly some conformance test work. The March meeting will Start on the Monday at 0800, and each group will get its relevant sections to work on. Dave Bagby pointed out that comments often refer to more than one paragraph. Ed Geiger felt that there might be a problem in splitting the areas, since people may need to be in several places at once. He suggested that technical comments should be dealt with as a higher priority. This was generally agreed. The agenda proposed by the chair was adjusted and then agreed with.

* **Mailing Dates:** First mailing goes out on January 20, second mailing February 10. This one will contain the ballot results. The ballot results will be placed on the FTP server as soon as they are ready.

16.5 Future Meetings Future meetings: Motorola are looking into hosting the August/September meeting: it will have to be at the end of August if Chicago is the venue. After discussion, it was suggested that the second ballot should go out after the November meeting. Michael Fischer and Jim McDonnald will investigate further.

ACTION: Jim McDonnell/Michael Fischer

Chair shows schedule for future plenary and intermediate meetings

16.4 Other Intermediate Meetings required? None.

17 New business

18. Closure Move to adjourn meeting. Proposed: Ed Geiger Seconded: Wayne Moyers. For: 18 Abstaining: 0 Against: 0 The meeting was closed at 14:00 hours

Tentative Meeting Schedule

Date	Month	Year	Place	Type	Location	Host
6-10	Mar	1995	West Palm Bch, FL	Plenary	Ramada	
8-11	May	1995	Salt Lake City, UT	Inter	Open	Novell
10-14	July	1995	Maui, HI	Plenary	Hyatt Regency	
TBD	Sept	1995	TBD	Inter	Open	
6-10	Nov	1995	Montreal, PQ	Plenary	Queen Elizabeth Hotel	
11-15	March	1996	La Jolla, CA	Plenary	Hyatt Regency	
8-12	July	1996	Netherlands	Plenary	?	
11-15	Nov	1996	Vancouver BC	Plenary	Hotel Vancouver	

Appendix 1
Attendance list

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Appendix 1

Attendance list (continuation)

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Appendix 1
Attendance list (continuation)

<u>First name</u>	<u>Last name</u>	<u>Status</u>	<u>Company</u>	<u>communications</u>
Mr. CHANDOS	RYPINSKI	voter	LACE Inc.	+1 415 389 6659 rypinski@netcom.com
Mr. LEON S.	SCALDEFERRI	voter	NSA R22	+1 301 688 0293 lsscald@alpha.ncsc.mil
Mr. GLEN	SHERWOOD	voter	INTERMEC Corp.	+1 206 356 1791 glens@intermec.com
Mr. THOMAS	SIEP	voter	Texas Instruments	+1 214 995 3675 siep@hc.ti.com
Mr. NATHAN	SILBERMAN	voter	Consultant	+1 408 253 5066 snathan@netcom.com
Mr. GREG	SMITH	voter	GEC Plessey Semiconductors Inc.	+44 522 502371 smith_g@lincoln.gpsemi.com
Mr. JOHN	SONNENBERG	voter	Pulse Engineering Inc.	+1 619 674 8360 johnsonnenberg+asdcorp%pulse@mcimail.com
Mr. PAUL F.	STRUHSAKER	voter	Aironet Wireless Comms. Inc.	+1 216 665 7919 pstru@telxon.com
Mr. ADAM	TUCHOLSKI		ZiLOG	+1 408 370 8028 atuc@zillog.com
Mr. SAROSH	VESUNA	voter	Symbol Technologies Inc.	+1 408 369 2657 saroshv@psd.symbol.com
Mr. HIROHISA	WAKAI	voter	SHARP	+1 510 642 0304 wakai@shpcsl.sharp.co.jp
Mr. RICHARD E.	WHITE	voter	Motorola Inc.	+1 708 576 7878 rick_white@wes.mot.com
Ms. QING	YANG		Diablo Research Corp.	+1 408 730 9555 qyang@attmail.com
Mr. LAWRENCE H.	ZUCKERMAN	voter	Advanced Micro Devices	+1 408 749 4934 larry.zuckerman@amd.com