

January 1999

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Backward Interoperability to FH

- There is a significant volume of 802.11 interoperable FH radios being sold today by a number of manufacturers
 - HR/DS/FH will enable FH users to migrate to HR/DSSS
 - Users can maintain investments in low cost FH appliances while also adding rate scaling capability using HR/DSSS
 - Option brings together the previously distinct FH and DS camps
 - Any station which can support the HR/DS/FH will also be required to support the basic HR/DSSS, HR/DSSS/short, and by inference legacy DSSS and FHSS
 - Home centered initiatives coming out with new FH solutions
 - HomeRF is based on the 802.11 FH; considering using whatever mechanisms we develop here to provide higher data rates
- Coexistence to basic HR/DSSS and DSSS can be improved by additional CCA requirements on HR/DS/FH units
 - Use wideband energy detect with timeout or
 - Use full bandwidth correlation detection

Submission

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D. kawaguchi, Symbol Technologies

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Robustness in Interference Limited Environments

- Symbol's experiences in the 900 MHz band since 1990 have shown
 - Fixed frequency systems will fail in the presence of fixed freq interference
 - Changing channels is slow and often does not work
 - Our proprietary 900 MHz DS system has evolved into a hopping DS system to provide reliable connection in the presence of interference
 - The 2.4 GHz band may eventually be worse than the 900 MHz band since it is the only unlicensed band available worldwide
 - Also, non-802.11 systems in this band are already and will continue to be a significant portion of the usage of this band
- Hopping of the wideband HS signal will provide protection against a variety of fixed frequency and hopping interference
 - As a last line of defense, backing down to 1/2 Mbps FH with 79 1 MHz channels will provide the best chance of operating through interference.

Submission

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Limitations

- There were some limitations that were pointed out in my original presentation in March 98
 - Most efficient use of the band would be achieved by frequency planning in a cellular arrangement such as used by DS
 - However, that requires exclusive use of the band which cannot be guaranteed in the unlicensed ISM band
 - It trades off the efficiency of the cell planning approach for the reliability of frequency hopping and the flexibility of scaling down to a 1 MHz narrow FH signal
 - Backward interoperability with the DS PHY necessitates turning off the hopping feature since hopping is not part of existing DS PHY
 - In addition, we recognize that the FH/DS cross CCA issues must be resolved because this option uses both modes
 - I made specific recommendations in the letter ballot 16 comments to add the cross mode CCA requirements to resolve this issue

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Goal: Work Toward Consensus

- Dateline: March 1998...
 - FH and DS interoperability was part of the comparison criteria
 - Symbol and Harris presented proposal for FH interoperability option
 - Lucent and Micrilor unilaterally accepted same method for in their proposal to provide FH interoperability
- Dateline: Today (January 1999)
 - The FH interoperability mechanisms have been refined and clarified over the past year but remain essentially the same
 - We have 77% approval of the draft and rising
 - 6 out of 9 NO-FH votes are from Lucent saying that there are some problems with it so throw it out
- Goals: Build on our hard earned progress rather than destroying it
 - There are limitations to what this mode can do as we pointed out from the beginning, but it fills a need that goes unanswered without this option

Submission

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D. kawaguchi, Symbol Technologies