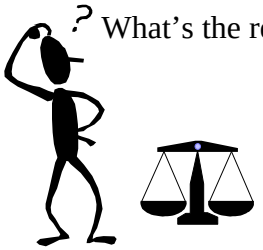
IEEE 802.11

The Standard to Rely On?



What's the real difference? What is important?

Requirements

- The indoor Channel multipath
  - Delay spread causes "self induced interference". Frame Error Rates is a user's and MIS manager's nightmare!

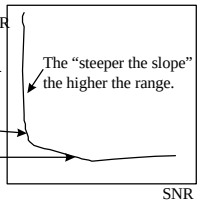
  - 10% FER will cause system failures for a significant part of the user community. A small 1000 node system will give 100 support calls! The answer is not "move your notebook into a smaller office!!!

    Without proper attention the standard will be "plug and pray" for the user!

The Channel Results

-90 dBm sensitivity is achievable! What you get “over a cable” does not translate into indoor coverage!
The real test is in the practical “radio channel”:

The Engineering Challenges



- Solve the indoor multipath problem
  - In the noisy channel
  - In the self interference limited channel
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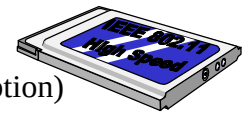
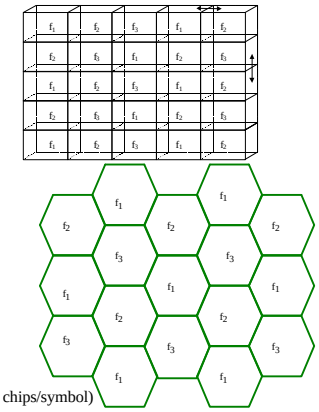
- PC-Card Format



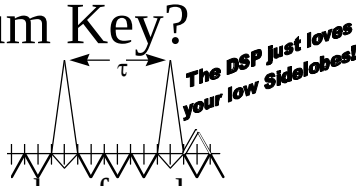
  - (integration and power consumption)
    - Keep the processing simple, but effective!
    - Pick the best waveform which optimizes the TX and RX current consumption needs.
    -

The Engineering Challenges

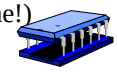


- A "System Solution"
  - Peak Data Rates
  - Maximize # Reuse Channels
- Regulations (Spread Spectrum)
  - USA (FCC)
    - 11 chips/symbol +CW test
  - Japan (MPT)
    - Ratio RF BW/Symbol Rate (need >10 chips/symbol)
  - ETSI (Europe)
    - Spread Spectrum Power Density
    -

Spread Spectrum Key?



- The Barker Sequence!
  - This simple waveform is the key for a low complexity solution to the multipath processing issue!
    - Simple means:
      - The DSP processor is not "gate limited" (60k Gates and you have excellent results, your multipath headache is gone!)
      - The current consumption is very low:
        - DSP in CMOS RX <100mA @3.3V. **A total PC-CARD solution <300 mA (TX and RX) is not a problem!**



Intellectual Property

- Clear IP coverage is necessary, we can not make any false assumptions!
- A clear “safety net” for all, as part of the IEEE 802 process, due to the PPM IP.

Summary

- PC-Card Form Factor ✓ Integrated unit
- Low Power Consumption ✓ < 300mA @3.3 V possible
- International Rules ✓
  - FCC, ETSI
  - MPT (Japan)
- Robust Radio in multipath ✓
  - Not only for a small office!
- Intellectual Property Protection ✓