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

- 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 ✓