ELEX 7860 : Wireless System Design
2013 Winter Session

Assignment 4

Presentations May 13, 14 and 15.

Introduction

In this assignment you will investigate a wireless communication standard and present your results to the class.

Students may work individually (one student for one standard) or in pairs (two students on one standard). Each student will have about 10 minutes for their presentation. Pairs will present jointly and get 20 minutes for their presentation. There will be a few minutes after each presentation for questions. Your presentation should consist of no more than one (simple) slide per minute.

Presentations will be marked on how comprehensively and correctly you answer the questions below and on the quality of your presentation (including not exceeding the time limit). Students working in pairs will, of course, be expected to investigate their standard in more detail.

The presentations will be uploaded to the course web site and the exam may contain questions on the content of the presentations.

Standards To Be Covered

- GSM (2G cellular phone (GSM))
- IEEE 802.11 Wireless LAN
- 3GPP WCDMA (3G cellular phone)
- Bluetooth Wireless PAN
- Digital satellite TV broadcasting (DVB-S)
- LTE (4G cellular phone)
- DECT cordless phones
- Data Over Cable (DOCSIS)
- North American Terrestrial Digital TV broadcasting (ATSC)
- ISO/IEC 14443 (contactless "smart cards")

Questions to Answer

- general information: purpose, system architecture, examples of typical devices
- how is this communication system standardized (sponsoring organizations, standards documents, industry groups, compliance testing, ...)?
- market: estimate the number of users, revenue from equipment sales, revenue from providing service
- frequency band(s) and channelization
- describe the available data rate(s), modulation, coding and multiple access techniques
- speech/video coding (if applicable)
- security: how are authentication and encryption handled? have these been "broken"?
- give a high-level example of a typical link budget including path loss, antenna gains, transmit power, bandwidth, noise figure, baseband SNR, ...

Sources of Information

- books
- standards documents (ITU, 3GPP, IEEE 802, ETSI)
- government regulations (FCC CFR 47)
- articles in journals (IEEE)
- internet web sites (verify against other sources)

Hints

There is much more material available than you will be able to read. You will have to read selectively. Keep in mind the specific question you are trying to answer. Try to verify each fact using an independent source.

Format

To minimize the overhead in switching between presentations, please supply your presentation before the lecture in one of the following formats:

- supply a simple PDF file (without sound, video or scripts) by e-mail
- supply an `http:` URL pointing to a web page that uses only cross-browser HTML/CSS/Javascript (no plugins or applets such as Flash or Java) by e-mail
- supply your own device to do the presentation (needs to have a VGA video interface)