

PROJECT DESCRIPTION, EITN21, FALL 2017, HT2

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Task 1: Your task is to implement an OFDM system over the air interface via speakers and mics. The system should be capable of transferring a file (text, picture etc.) from one computer to another. Most system parameters are optional, but the system must include the following components:

- A minimum of 64 subcarriers.
- 4-QAM symbol constellation, or larger.
- Your System must at least operate at 0.5 kb/s.
- Minimum separation between speaker and microphone is 1 meter.
- Minimum length of file: 20000 bits.

A convolutional code is optional, and can be used if there is need for it. As soon as you can, reliably, transmit and decode the signal, you have passed Task 1.

Task 2: In Task 2, a full duplex system should be implemented. The system should be packet based, and each packet must consist of at most 1000 information bits. In addition, parity bits should be inserted at the transmitter for each packet via a CRC. All packets are next sent to the receiver, which decodes each packet, and verifies the parity bits. The system parameters are the same as for task 1. Note that the packet length is subject to optimization. If the packet length is long, there will be many re-transmissions. The receiver next acknowledges the correctly decoded packets, and asks for re-transmission of the incorrectly decoded packets. The transmitter now re-transmits the requested packets. This process is repeated until all packets have been correctly received at the receiver. A particular nice way to present this task is to let the file represent a picture. Then the receiver can plot the correctly decoded packets to the screen, while the incorrect packets show up as noise.

Form of presentation: Task 1 should be submitted no later than, Dec 4, 2017, at 12.00 and Task 2 should be submitted no later than, Jan 8, 2017, at 12.00. The reports should be 2-3 pages written reports including a block diagram of the system, a plot of the results and with the full code as an appendix.

There will be no public presentation, but a short individual oral presentation as in HT1. Book a time with Fredrik well in advance. If you fail to meet the deadlines, you will not pass the course.

Both members of the group will be examined individually! All details of the system must be known to both group members.