Binary Phase Shift Keying modulation for FPGA with Python/Amaranth

Time & Frequency department

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slides and references at

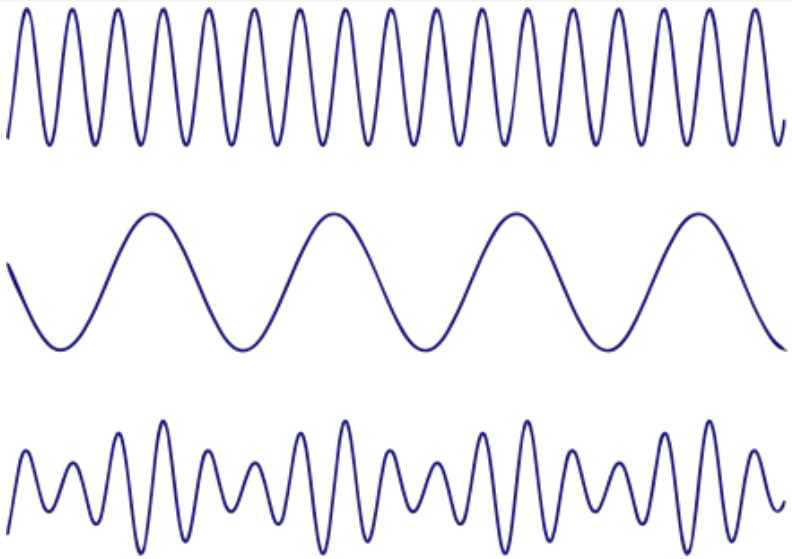
`https://github.com/oscimp/amaranth_twstft`

Outline

Plan

Radio modulation

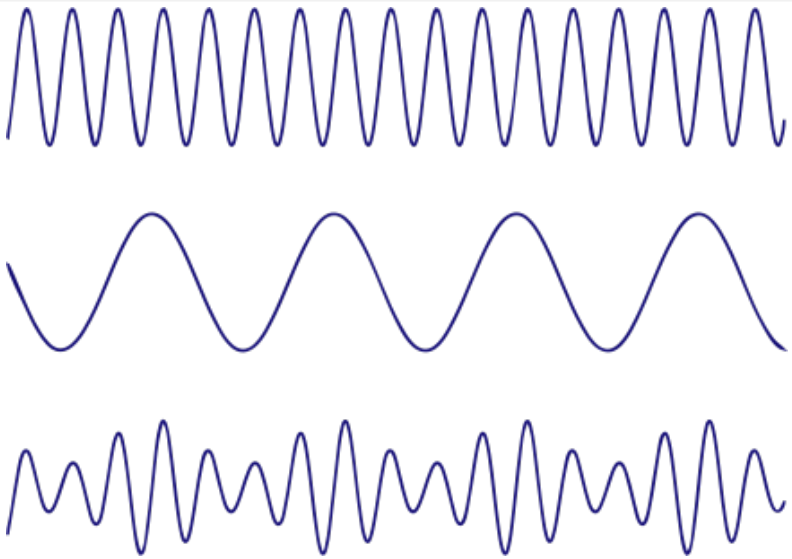
Common modulation techniques



Radio modulation

Common modulation techniques

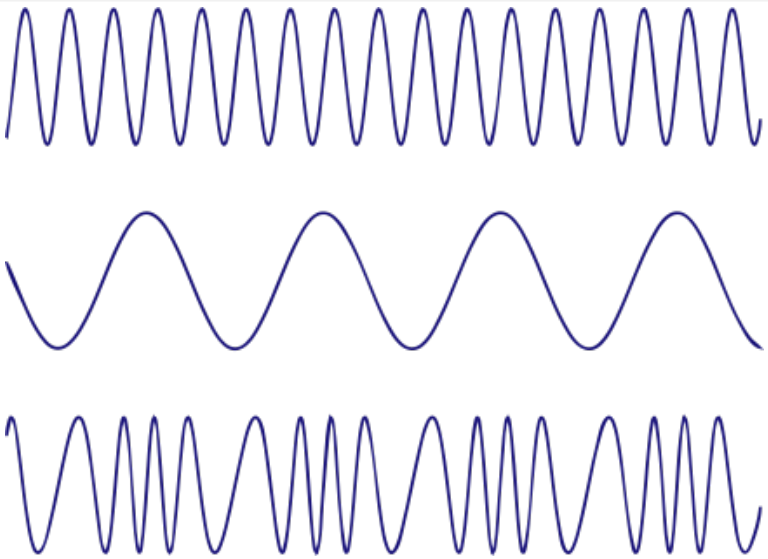
- Amplitude Modulated (AM) radio signals



Radio modulation

Common modulation techniques

- Amplitude Modulated (AM) radio signals
- Frequency Modulated (FM) radio signals



Radio modulation

Common modulation techniques

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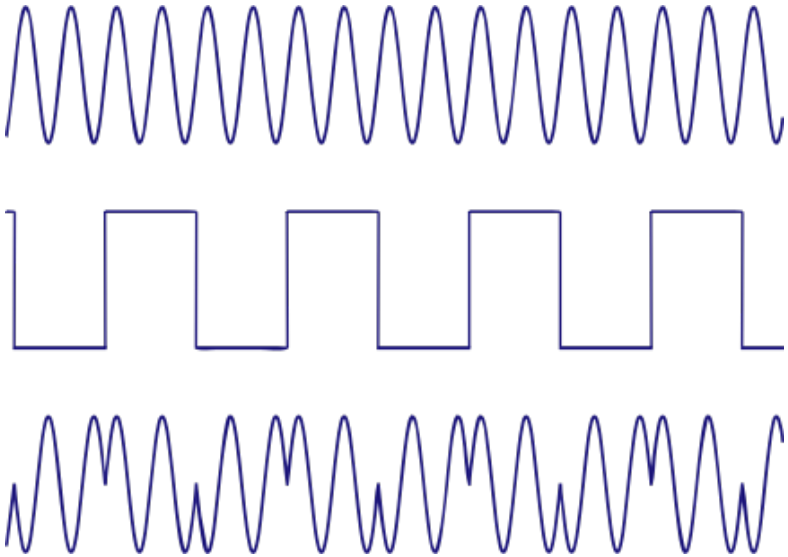
- Frequency Modulated (FM) radio signals
- N-Phase Shift Keying (NPSK) modulation



Radio modulation

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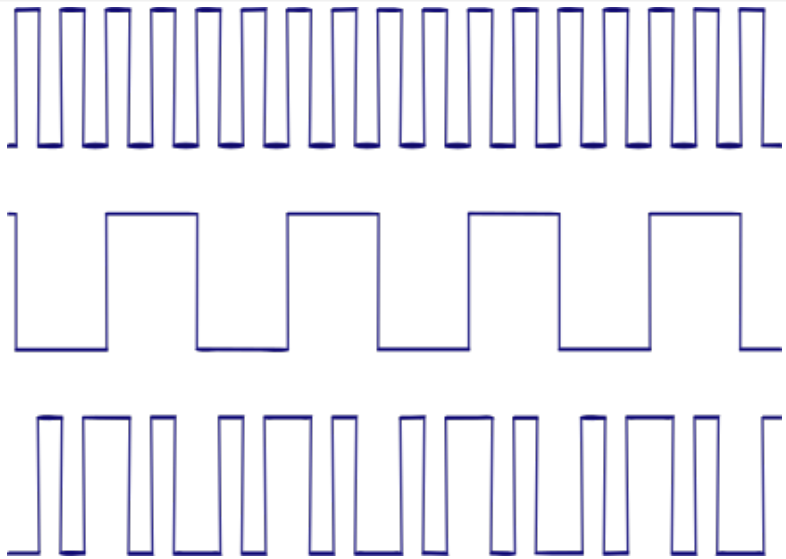
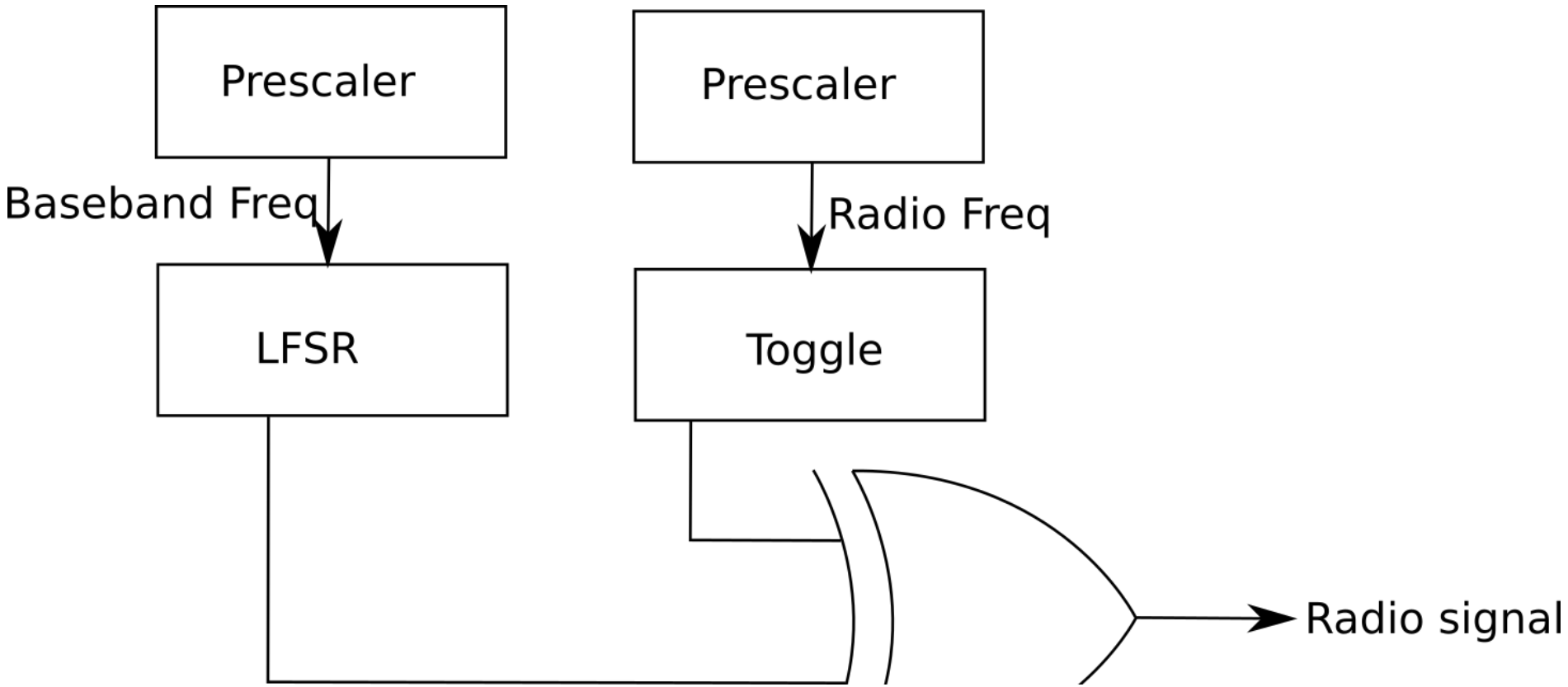
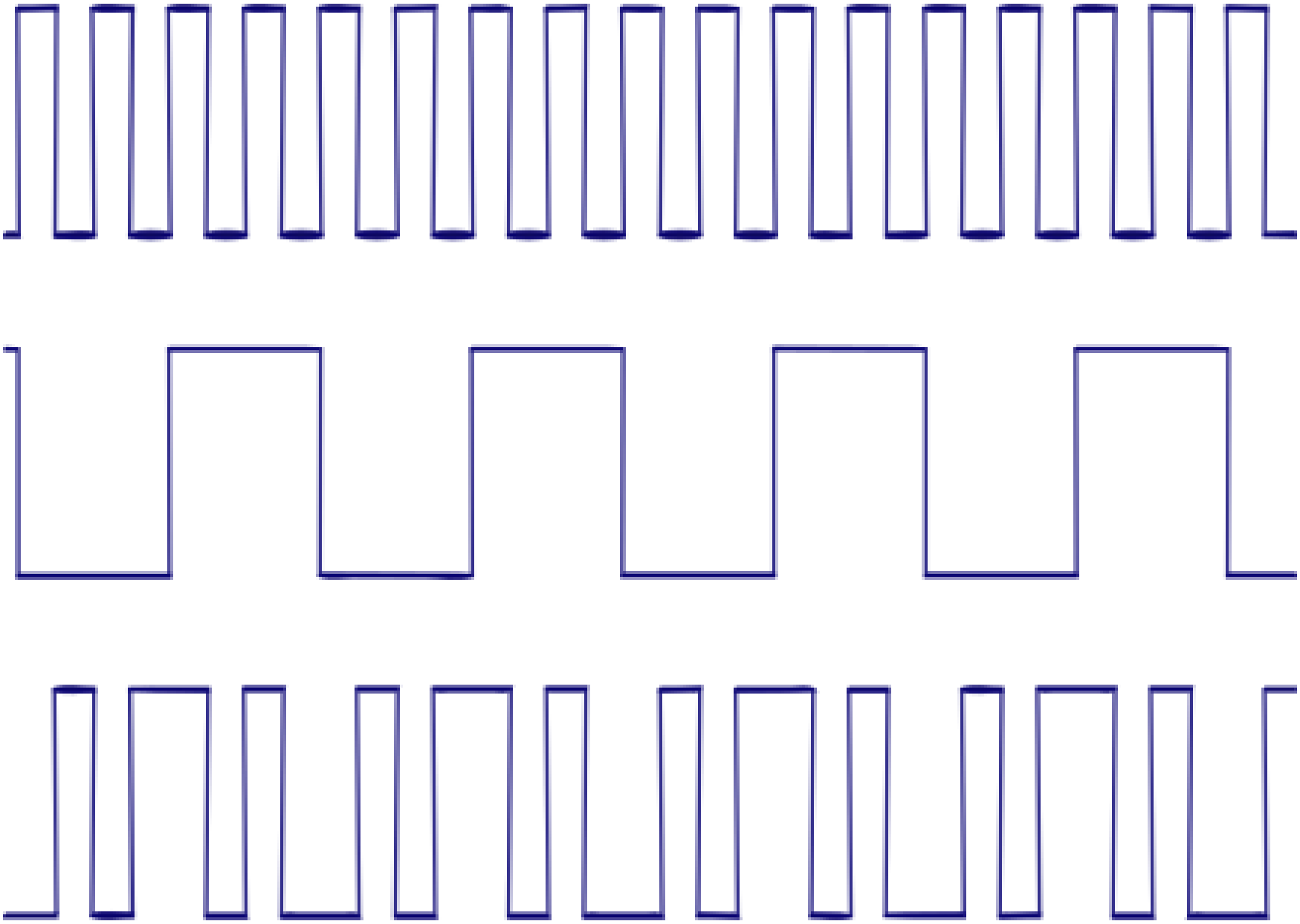
- N-Phase Shift Keying (NPSK) modulation



Plan

Architecture to describe





In the end...

- Overview of three modulation techniques
- Code your own version of a BPSK mixing algorithm using amaranth (3 steps) :
  1. demultiplying the clock signal to create a carrier signal
  2. demultiplying the clock signal to cadence the modulation
  3. create a binary version of the signal mixing operation