RF Sampling Architecture Overview

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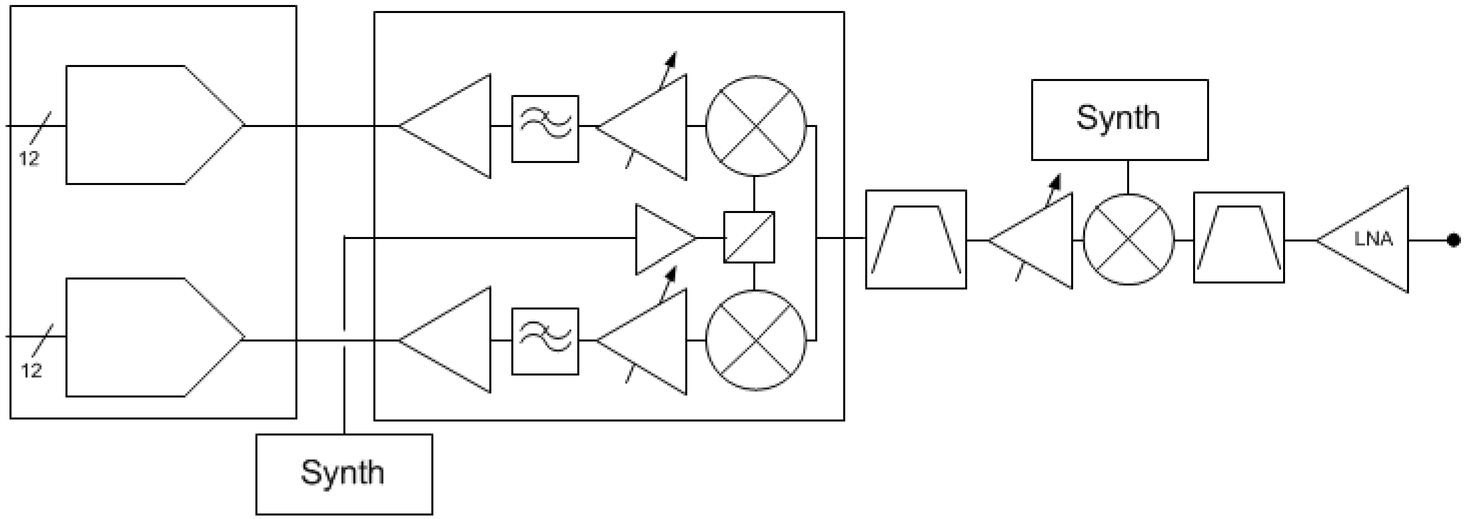
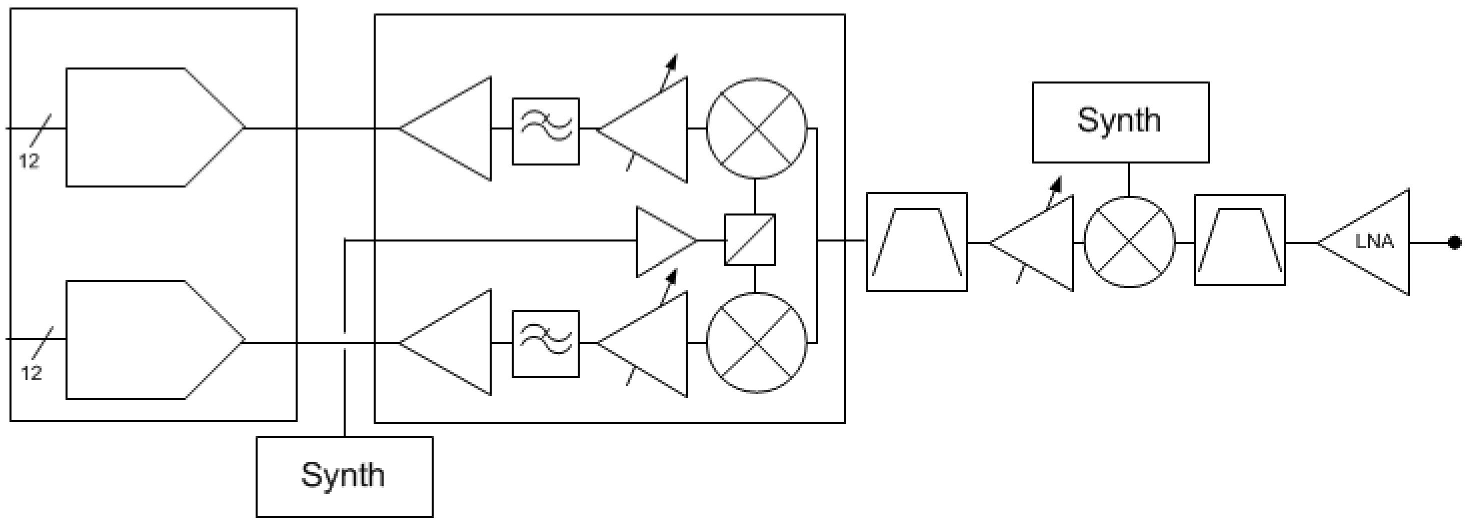
Traditional super heterodyne receiver



- Traditional architecture for measuring wide-bandwidth signals
  - Mixer down-converts RF/μ-wave band to IF band
  - Quadrature demodulator down-converts IF to BB
    - Utilize dual ADC to capture I/Q signals
    - ADC sampling speed needed to support half bandwidth of original signal
- Key issues
  - 1st mixer stage tunes frequency to fixed IF band
  - BB I/Q amplitude/phase balance impact signal integrity

RF sampling receiver



- Eliminate
  - Quadrature demodulator
  - RF synthesizer
- Replace: Dual ADC with one RF-sampling ADC
- Supports:
  - Higher signal bandwidths
  - Direct sampling of RF bands

RF sampling architecture

- Spectral performance
  - Support wide-bandwidth signals (or multi-mode)
  - Support for very large bandwidths not previously obtainable due to ADC sampling rate limitations
- Size and power dissipation
  - Size and power dissipation improvement by eliminating mixer, RF synthesizer, and BB signal conditioning components
- Flexibility
  - Wide bandwidth signals, multi-band applications and DPD expansion bandwidth
  - Higher density systems (MIMO, beam-forming, radar arrays)
  - Easier implementation for multiple standards or configurations (SDR)

Questions?

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