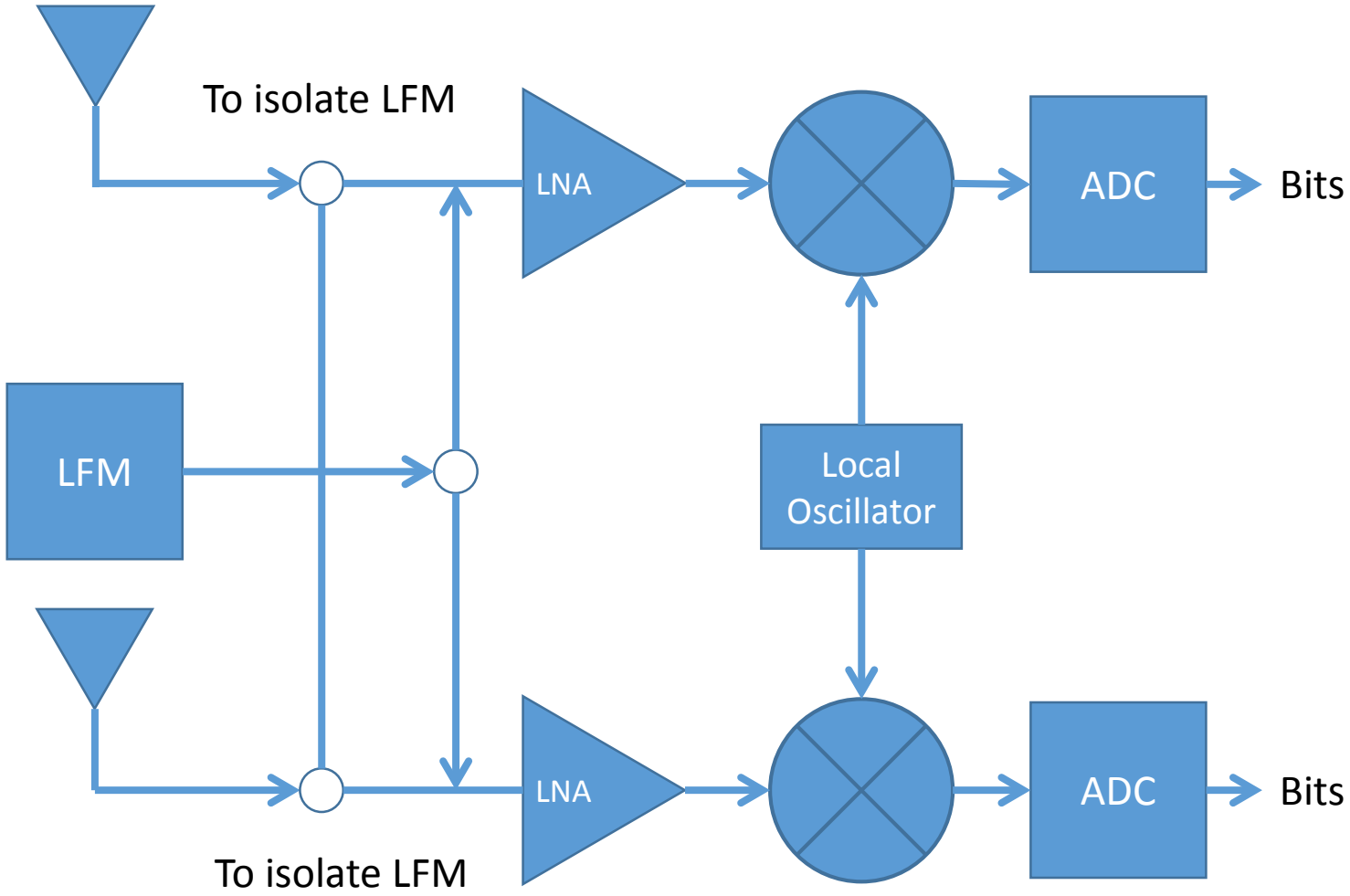
Ian's idea for solving issue of coherent detection on SDRs

- Multiple SDRs can be "virtually" synchronized by correcting for offsets in phase rather than actual synchronization. This is generally known as "**equalization**"
  - Ian's work with Lincoln Labs involved the use of the "**method of least squares filtering**."
  - The method involves the use of a **Linear Frequency Modulated (LFM)** signal and a **Finite Impulse Response (FIR) filter**
  - This method involves the following basic steps:
    1. Generate an LFM signal that covers the frequency bandwidth of the RF signals to be received in the system
    2. Feed these signals into the system as close to the antennas as possible so that the LFM signal "sees" all of the same environmental conditions as the real received signals.
    3. Use the method of least squares filtering to calculate the phase offsets of the SDRs with respect to one another (this is likely to be frequency-specific, hence the need for an LFM signal)
    4. Rapidly switch from the LFM generator to the actual antennas to begin receiving data
    5. Accounting for the offsets from calibration process, calculate phase differences between received signals
    6. Repeat 1-5 as needed to avoid excessive drift

Overview of equalization architecture



LFM frequency