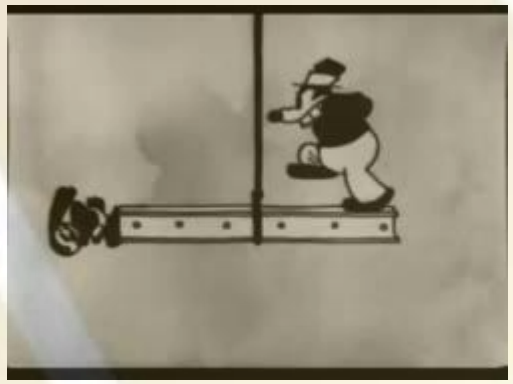


RF Components and Basic Concepts

1.11 - Phase locked loop

PLL

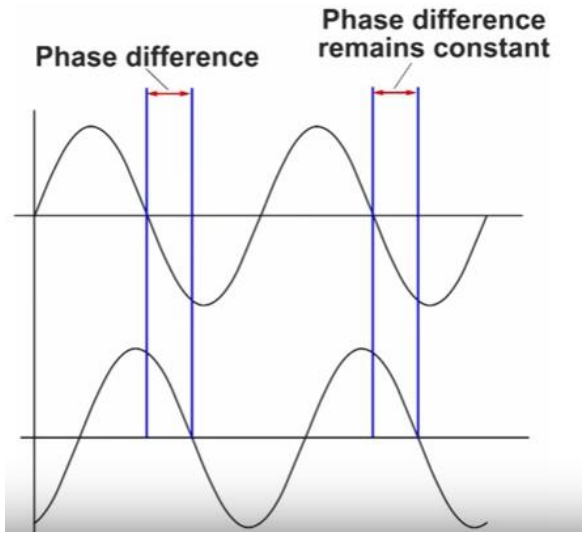
- A phase-locked loop is a feedback system combining a voltage controlled oscillator (VCO) and a phase comparator so connected that the oscillator maintains a constant phase angle relative to a reference signal.

- Phase-locked loops can be used, for example, to generate stable output high frequency signals from a fixed low-frequency signal.

PLL

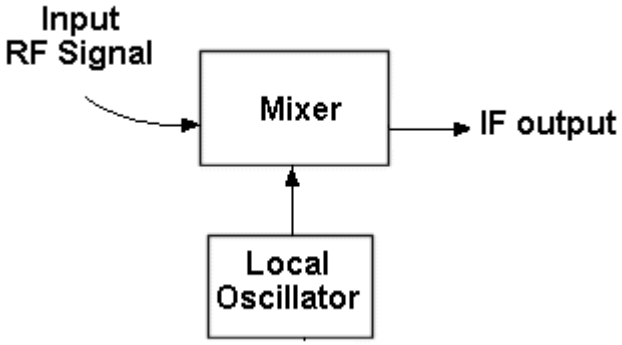
- When phase between signals changes it means that they have different frequencies.

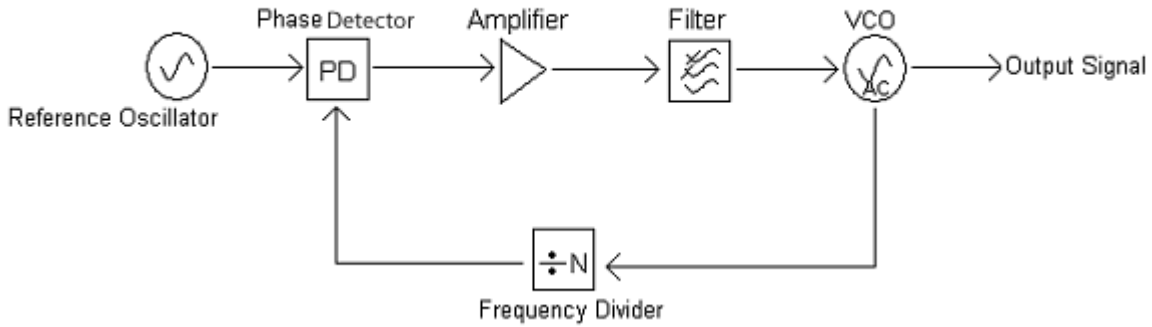
- When phase difference remains constant frequencies are equal.



Why we use PLL ?

VCO cannot produce stable high frequency carrier.
VCO is affected by temperature and noise.
We need a reference with stable frequency and we force VCO to follow that reference.





Question ??

- Why we need PLL if we already have stable reference oscillator ????
- Reference oscillator has low frequency such as crystal oscillator.

How PLL works ?