

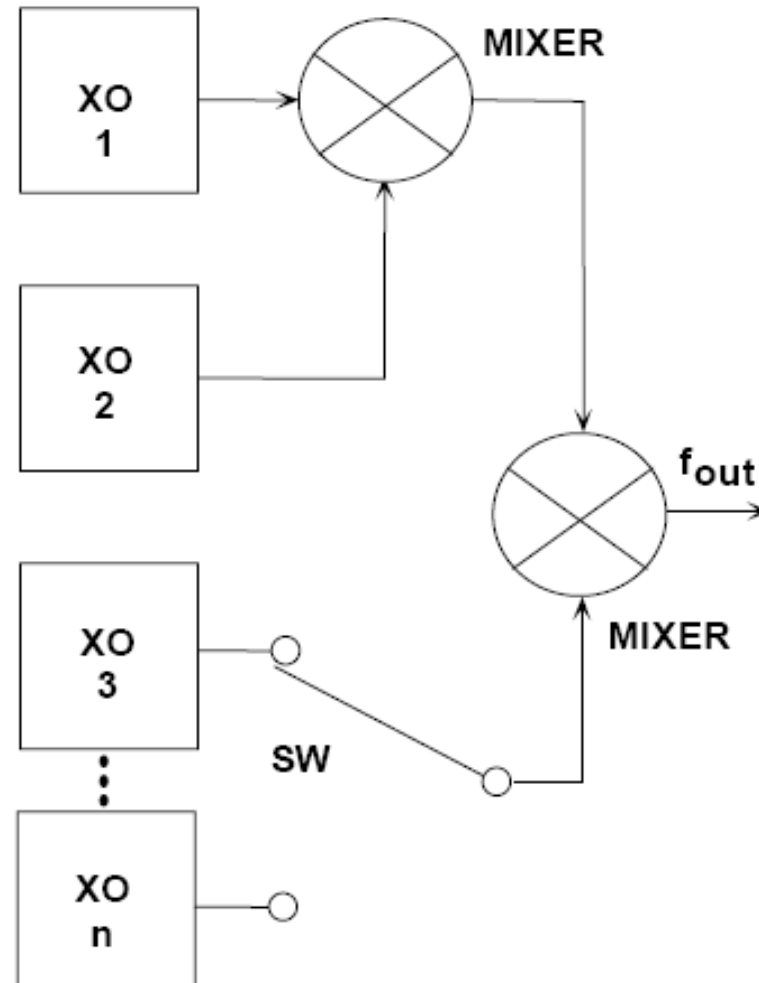
Signal (frequency) synthesis

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Oscillator-based freq. synth.

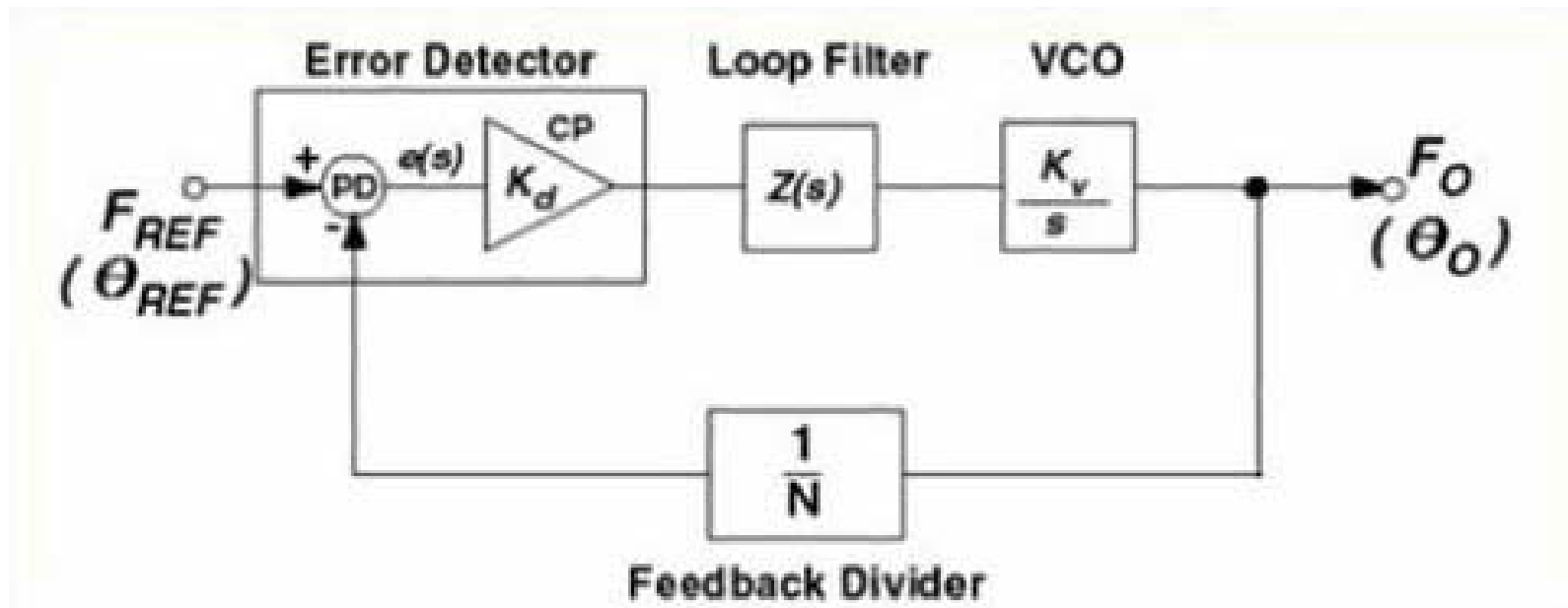
- Traditional way
- Uses a bank of oscillators
- Mixing, adding frequencies are performed by multiplier circuits (mixers)

- Oscillator bank



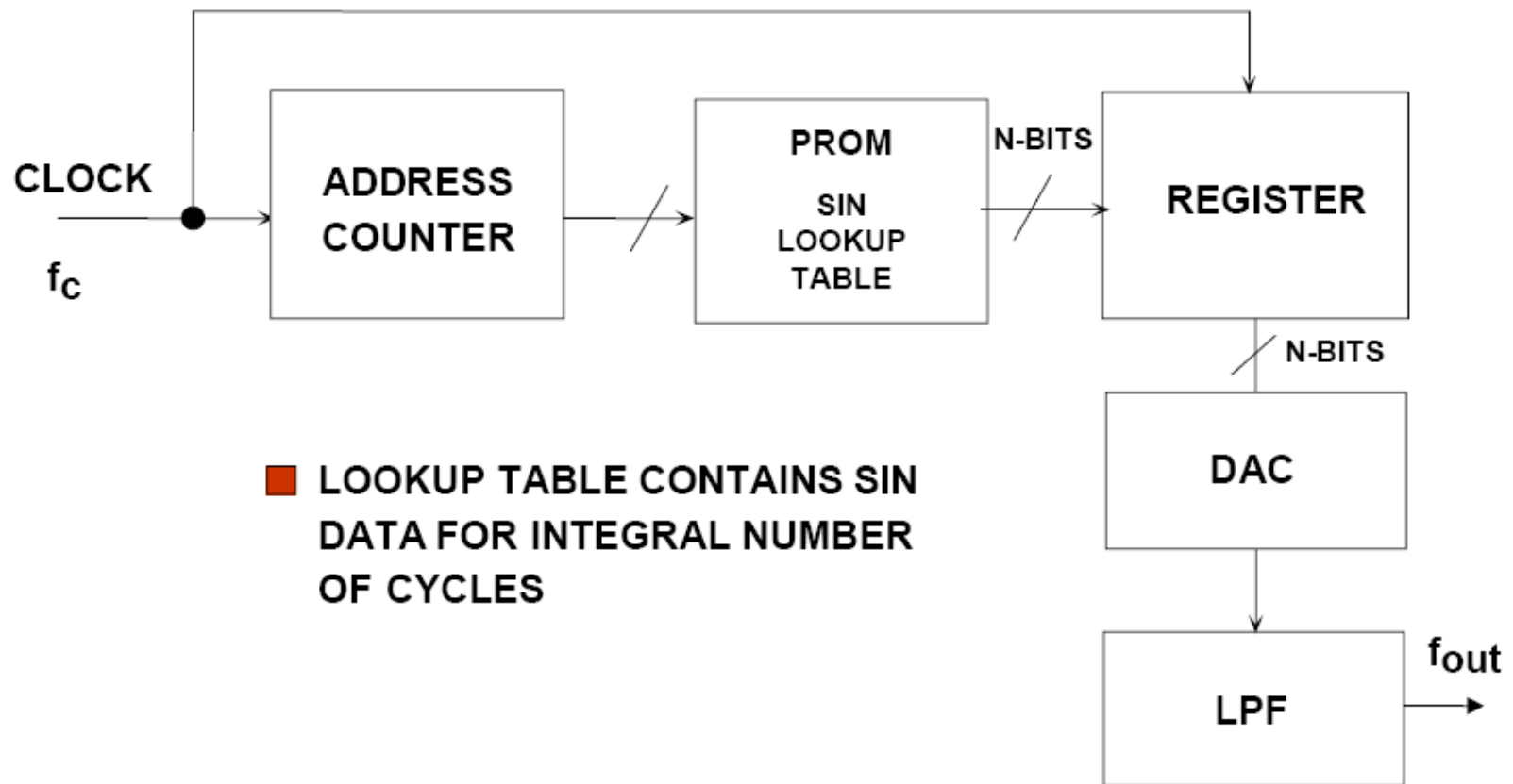
Phase-locked loop

- More flexible solution



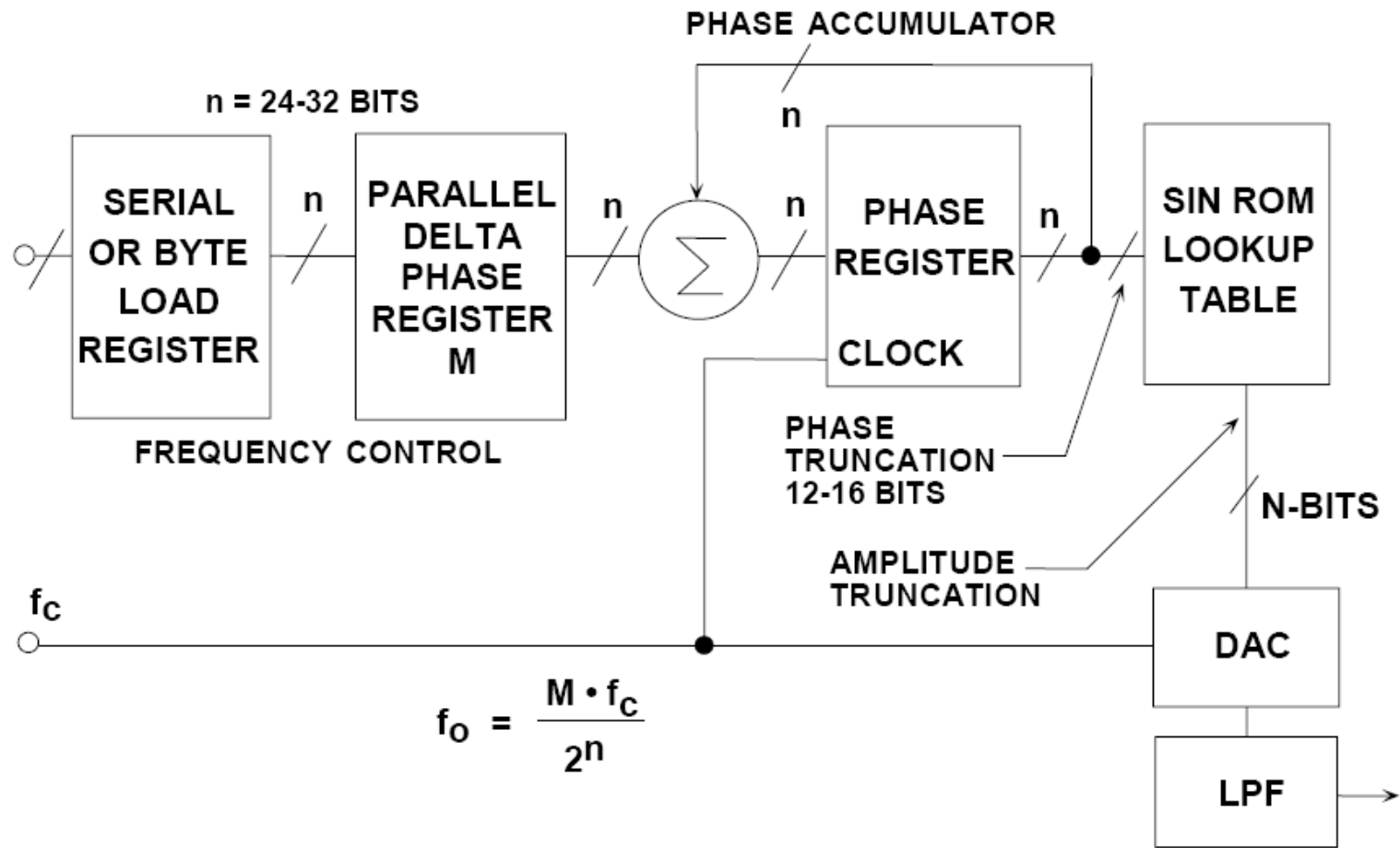
$$F_O = N \times F_{REF}$$

Direct digital synthesizer (DDS)



- In PROM arbitrary waveform can be stored (not necessarily sine)
- Frequency can be changed by
 - Changing f_c
 - Reprogramming PROM (not typical)

Flexible, NCO-based DDS



References

- Analog devices: Mixed signal and DSP design techniques