

# Carrier Acquisition

Phase-locked loop (PLL), if a "pilot" or carrier is transmitted:

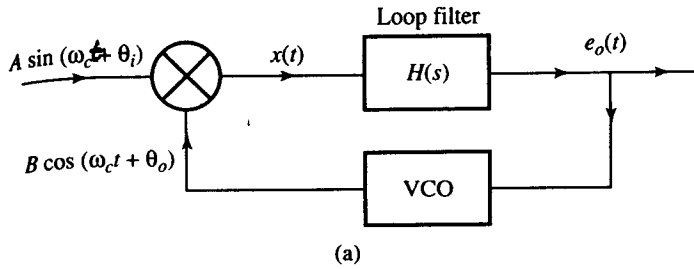


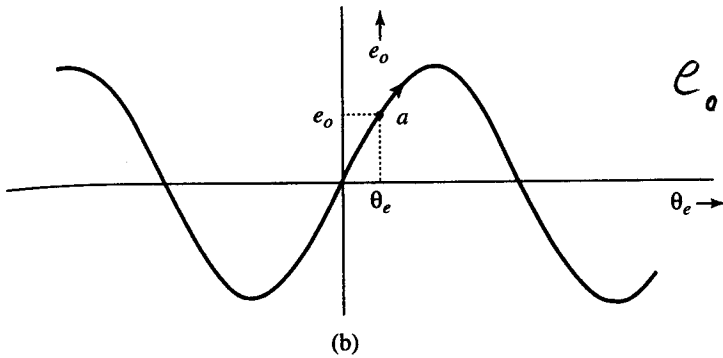
Figure 4.25 Phase-locked loop operation.

VCO:

$$\omega(t) = \omega_c + c e_o(t)$$

$$\theta_e = \theta_i - \theta_o$$

$$e_o = \frac{AB}{2} \sin \theta_e$$



For DSB-SC, use Costas Loop:

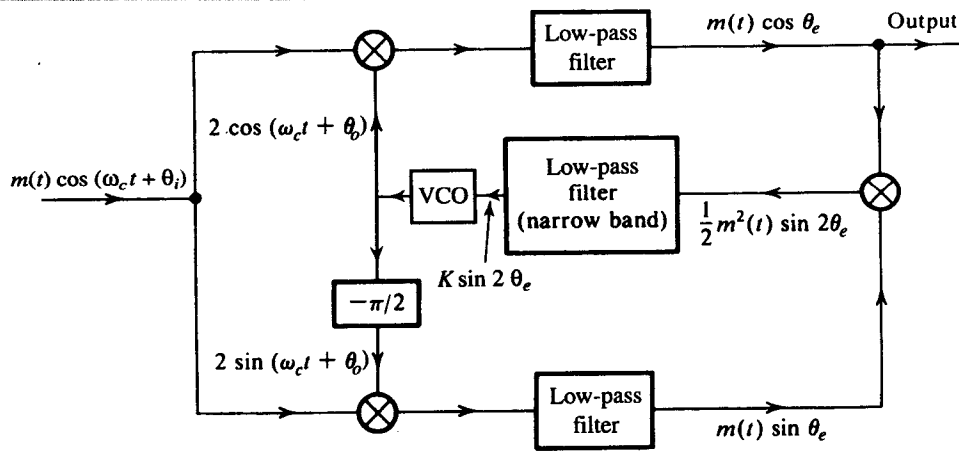


Figure 4.27 Costas phase-locked loop for the generation of a coherent demodulation carrier.

If use upper branch only, then

can't get sign of  $\theta_e$  from  $m(t) \cos \theta_e$ !