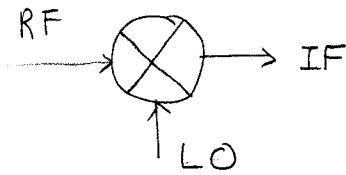


권라신은하리, Problem Set 1, Solutions

1.



2.

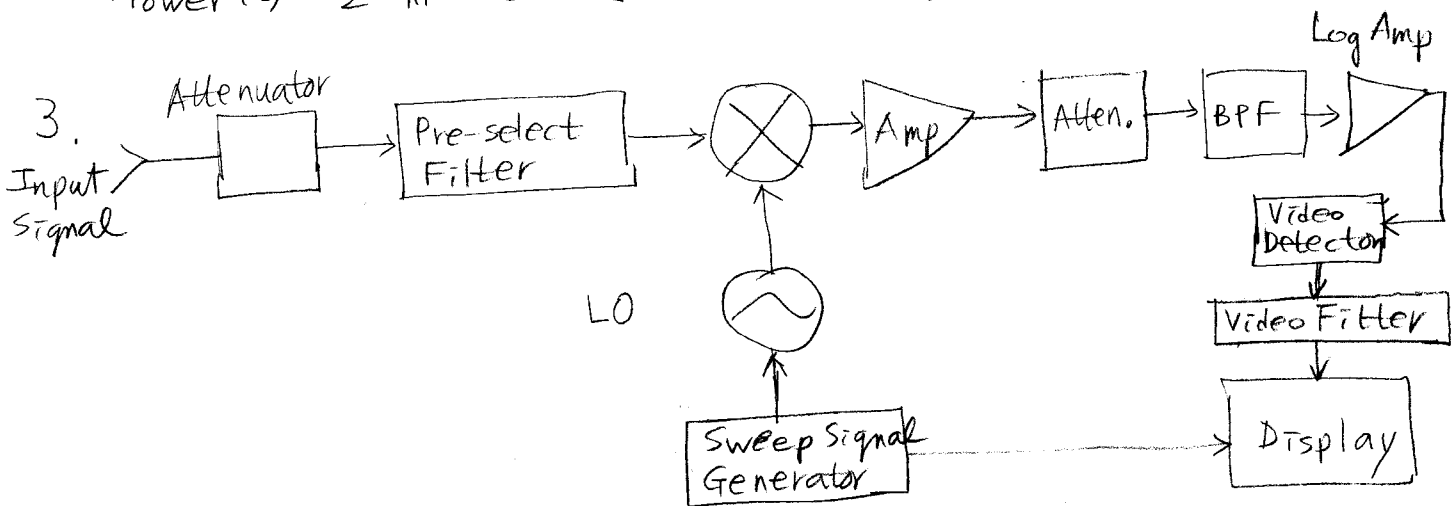
1)

$$V_{IF}(t) = V_{RF}(t) V_{LO}(t) = A_{RF} A_{LO} \sin(\omega_1 t + \phi_1) \sin(\omega_2 t + \phi_2)$$

$$2) V_{IF}(t) = A_{RF} A_{LO} \sin(\omega_1 t + \phi_1) \sin(\omega_2 t + \phi_2) \\ = \frac{1}{2} A_{RF} A_{LO} \left\{ \sin[(\omega_1 - \omega_2)t + \phi_1 - \phi_2] + \sin[(\omega_1 + \omega_2)t + \phi_1 + \phi_2] \right\}$$

$$V_{upper}(t) = \frac{1}{2} A_{RF} A_{LO} \sin[(\omega_1 + \omega_2)t + \phi_1 + \phi_2]$$

$$V_{lower}(t) = \frac{1}{2} A_{RF} A_{LO} \sin[(\omega_1 - \omega_2)t + \phi_1 - \phi_2]$$



4.

